F-111 Aardvark

in detail & scale

Bert Kinzey

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CONTRIBUTORS:

Jim Miklasevich
Robert J. Mills, Jr.
Thomas Jackson
Don Schmenk
Ray Leader
George Cockle
General Dynamics
U.S. Air Force
Jim Rotramel
Al Lloyd
Warren Munkasy
Don Linn
Lloyd Jones
Ed Boll
Grumman
U.S. Navy

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Front Cover: EF-111A in colorful markings. ***(Grumman)***
Rear Cover: Instrument panel in an FB-111A.

INTRODUCTION

The first RDT&E prototype F-111A, 63-9766. ***(General Dynamics)***

It is impossible to discuss the F-111, much less introduce a book on the aircraft, without using the word, "controversial." Indeed, the F-111 was, has been, and probably still is the most controversial aircraft in the history of military aviation. No other aircraft has had such a large number of critics that have been so consistent and visible in condeming on the one hand, and as large a group of supporters praising it on the other.

The other word most often associated with the F-111 is, "commonality." This was a goal of then Secretary of Defense Robert McNamara for the F-111 program, a goal which the program failed to achieve. Secretary McNamara envisioned an aircraft that would serve both the needs of the Air Force as a strike fighter and the Navy as a fleet defense fighter. So committed was the Secretary of Defense to his "do everything" aircraft that cartoons and jokes gained popularity representing the F-111 as a VIP transport, a tanker, freighter, and in other unlikely roles. The obvious fact that the F-111 could not fulfill all the roles and missions for which it was intended, and the Navy's cancellation of its version early in the life of the aircraft, soon caused the F-111 to be loudly criticized in the press and elsewhere.

Crashes added fuel to the fire of criticism, and even though the F-111 went on to accumulate a better safety record than any of the century series fighters, the F-4, or the A-7 (see page 7), the F-111 was condemned as being unsafe. Then in its initial combat deployment known as "Combat Lancer," a rash of quick, unexplained losses caused the withdrawal of F-111s from Vietnam. Now the critics felt that their point was proven, but they spoke little of, and few headlines reported, the F-111's return to Vietnam.

After redeployment to SEA, F-111s flew over 4000 sorties between October 1972 and March 1973. They flew in the worst weather, against the most heavily defended targets, and suffered a loss rate of only 0.15 percent. In that six month period, many aircraft, all F-111As, completed over 100 missions without receiving a scratch. In short, the F-111 proved to be the most survivable aircraft ever taken into combat. It is odd, but not surprising, that while the critics and problems of the F-111 were so highly publicized, that almost nothing was to be found in the press about its outstanding success. While the F-111 did not become the "do everything" airplane Mr. McNamara wanted, it did become the best interdiction and strike aircraft ever used in combat.

On the pages that follow, Detail & Scale is proud to present a detailed look at all versions of the F-111 that have been produced. Unlike other publications on the F-111, we have not limited ourselves to factory and military photos. Most of the detailed photographs were taken specifically for use in this publication. This provides more extensive and better quality coverage than is available in any other publication. We are especially pleased to present the most complete and up-to-date detailed coverage of the EF-111A "Spark Vark" ever published.

Adding greatly to this book are the efforts of two F-111 drivers, Captain Jim Miklasevich and Captain Jim Rotramel. Their assistance and cooperation is worthy of mention in this introduction.

DEVELOPMENTAL HISTORY

The second RDT&E prototype F-111A, 63-9767, in an overall bare metal finish. ***(USAF)***

Surprising as it may seem, the idea of a variable - sweep wing began way back in 1911. Experiments were conducted in France, and later the concept was introduced by a German designer named Adolf Busemann at a scientific convention in Rome. Further research was conducted by another German, Dr. Albert Betz, and in 1942 Messerschmitt began work on an aircraft with a variable-sweep wing which was designated the P-1101.

The P-1101 did not fly before the war ended, and it was shipped to the United States and Bell Aircraft. This led to the design and flight of the Bell X-5, which was the first aircraft to fly with a variable - sweep wing. Later, Grumman built and flew their XF-10F Jaguar, which also featured a variable-wing.

In 1959, engineers at NASA's Langley Research Center in Virginia came up with a two-pivot variable-sweep wing, and it was this concept that made the in-flight variable geometry wing a workable idea. The X-5 and XF-10F had single-pivot wings.

With the variable-sweep wing now technically feasible, the U.S. Air Force issued System Development Requirement (SDR) Number 17 for weapon system WS 324A. This was followed by Specific Operational Requirements (SOR) 183 which called for a Mach 2.5, 60,000 foot altitude, all-weather, day-night, two-crew, STOL fighter. It was to be able to operate on sod fields of less than 3000 feet, have an 800 mile low-level combat radius, and have a 3,300 nautical mile ferry range. The new fighter was to be capable of carrying loads up to 30,000 pounds, 1,000 pounds of which was to be carried internally. Also included in the SOR was a reconnaissance version.

In October 1960, the Air Force was ready to go to the industry with its requirements, but the Office of the Secretary of Defense asked that the Air Force delay the project, which in December became known as TFX, Tactical Fighter Experimental.

In January 1961, John F. Kennedy was inaugurated President of the United States. With him he brought a lot of young, brilliant minds to fill the top level positions of the government. These men became known as "wiz kids," and supposedly were able to handle their jobs more efficiently than ever before because of their intelligence. They were managers and organizers, and used all the tools of organization like flow charts, graphs, studies upon studies, and of course, meeting after meeting to give guidance and provide coordination. Unfortunately they most often did not know much, if anything, about the area in which they worked.

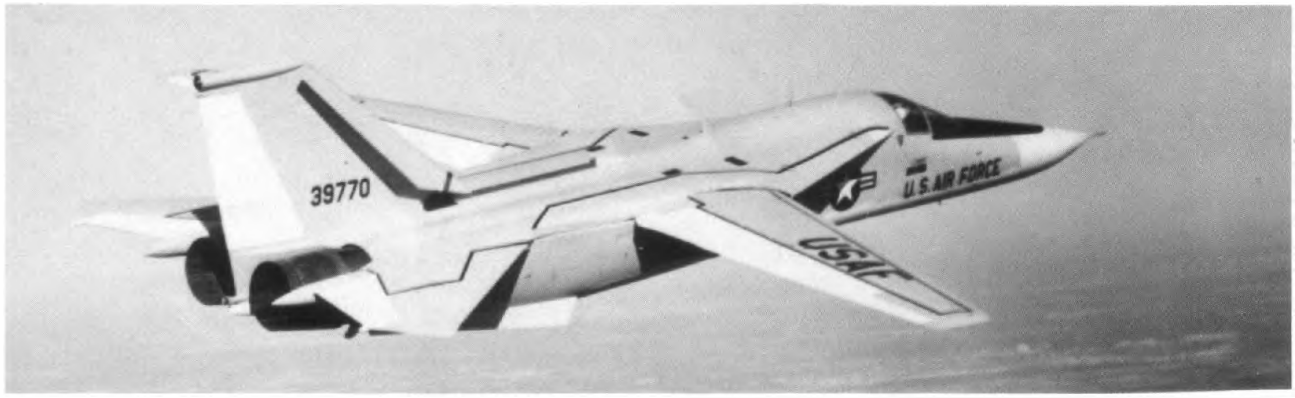
One such man was Robert McNamara, Kennedy's Secretary of Defense who had been with the Ford Motor Company. It is reported that once, when he was watching a fly-over from the deck of an aircraft carrier, he remarked, "What good are all those different kinds of planes?" McNamara thought that a lot of money could be saved if all the services used one kind of aircraft to perform their different missions and fulfill their varied needs. The concept was called "commonality." In February 1961, less than a month after taking office, McNamara asked the Air Force to determine if the Army's need for a close air support aircraft, and the Navy's requirement for a fleet defense fighter could be filled by the TFX. In June he instructed the Air Force and Navy to work together to meet both services' requirements with the TFX. From the very beginning, this idea proved to be very unpopular with both services. Even though all of the proposals submitted by nine contractors were found unacceptable, the Air Force's future version was designated F-111A, and the Navy's version was designated the F-111B. This happened in December 1961, even though the primary contractor had not been selected, and the configuration of the aircraft had not been decided upon!

The third RDT&E prototype F-111A, 63-9768, in flight. Early USAF F-111s carried the gull gray and white Navy paint scheme. *(USAF)*

Underside view of an early F-111A in flight. The thin gray areas on the trailing edges of the wings are devices for protecting the wing from damage as it folds back into the wing glove. *(General Dynamics)*

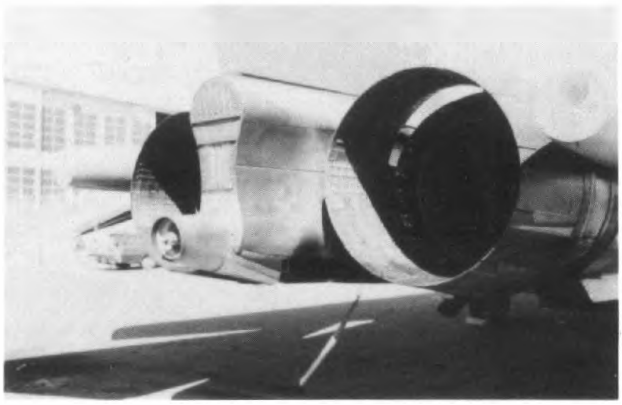
View from above of the ninth RDT&E F-111A. Note the walkway stripes, the position of the flaps and slats, and the position of the horizontal stabilizer. This aircraft was later lost in a crash. *(GD)*

Chocks are placed on the nose gear wheels of this early F-111A after a test flight. *(General Dynamics)*



Above: The fifth RDT&E F-111A, 63-9770, as seen from behind. Early F-111As and F-111Bs had a different tail design between the engines than was later used on production F-111s. Notice in this photo that the trailing edge on the area between the engines is in a straight line with the trailing edge of the rudder, and that it is tapered to a sharp edge.

(General Dynamics)



Right: In this photograph the same area is shown close-up on a production aircraft. Note that the trailing edge is perpendicular to the ground and that it is blunt with a cross section that is peanut shaped.

The proposals were narrowed down to those from General Dynamics and Boeing, and in November 1962, both the Air Force Council and the Air Force Selection Board chose the Boeing proposal, but Secretary McNamara ruled in favor of General Dynamics. This decision brought cries of "fowl" and special favoritism, not to mention a congressional investigation.

In December 1962, the Air Force initiated the procurement of 23 RDT&E F-111s. Of these, 18 were to be F-111As, and five were to be F-111Bs. Grumman was assigned as prime contractor for the F-111B.

The first F-111A was rolled out on October 15, 1964. At the ceremony, Secretary McNamara said, "For the first time in aviation history, we have an airplane with the range of a transport, the carrying capacity and endurance of a bomber, and the agility of a fighter pursuit plane." McNamara was either grossly misinformed, or was simply misstating the facts. Any major transport then in service, from the C-118 to the C-124, and certainly the C-135 could fly much further than the F-111. The two bombers, the B-52, and B-58, had greater range, endurance, and payload capability, and every "century series" fighter, including the F-105, was far more agile and maneuverable than the F-111.

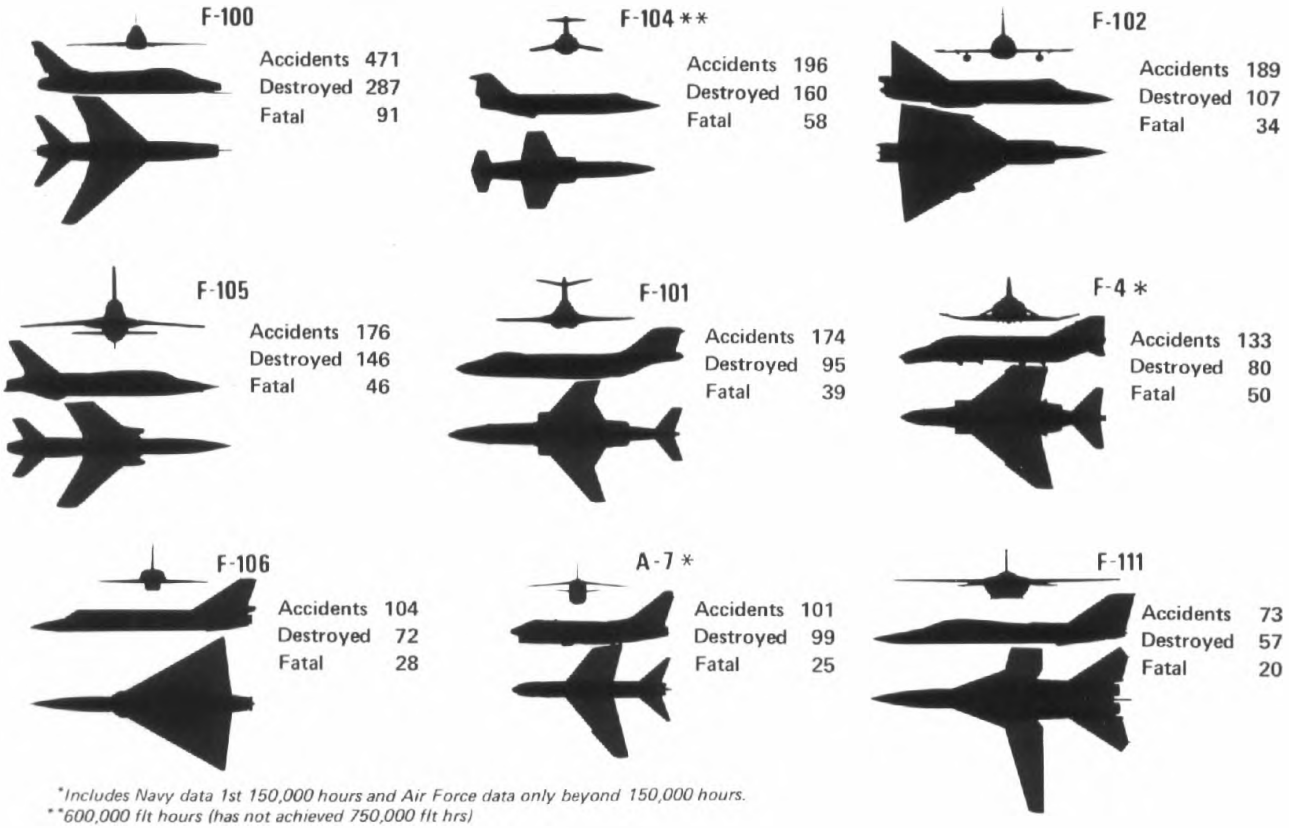
The F-111A RDT&E aircraft ran into a number of problems, mostly centered around the engine, and McNamara's "commonality" went out the window when it proved unworkable with the Navy's F-111B which was cancelled in August 1968. At one point things got so bad that McNamara tried to manage the program himself, which in some people's estimation was the worst thing he could do. The Secretary was not a project manager, and his lengthy meetings caused General Dynamics' President to complain that there was not enough time left to work on problems!

A number of crashes occurred prompting the press and Senator McClellan to heap criticism on the F-111 program. Ironically, the first fatal accident occurred on January 19, 1967 when aircraft number 9 (63-9774) crashed, not because of a faulty airplane, but because of pilot error. In this case the pilot attempted a landing with the wings set at the wrong sweep. In attempting to correct the situation, he moved the wings in the wrong direction, and the aircraft fell short of the runway. The otherwise uninjured co-pilot was burned to death while trying to help the pilot escape.

Regardless of early problems, the F-111 went on to compile an excellent safety record as shown on page 7. It developed into the finest all-weather strike aircraft ever used in combat, and suffered the lowest

Accident Comparison

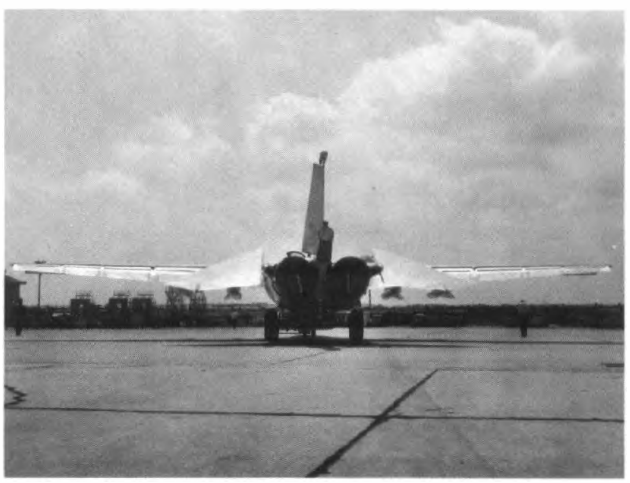
AT FIRST 750,000 HOURS OF FLIGHT TIME



*Includes Navy data 1st 150,000 hours and Air Force data only beyond 150,000 hours.
**600,000 flt hours (has not achieved 750,000 flt hrs)

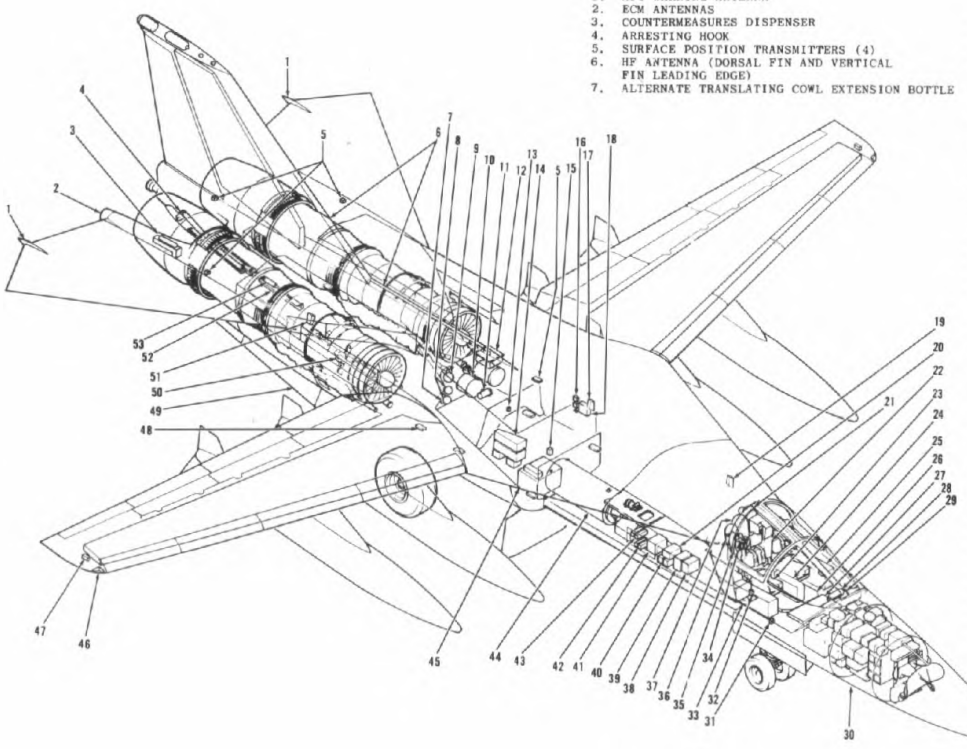
Although this chart has been published before, it is worth presenting again. While the F-111 gained a reputation as a dangerous aircraft that crashed with regularity, the fact is that it had a better accident record than any of the "century series," the F-4 or the A-7. It is the only aircraft of these types to achieve 750,000 flight hours with less than 100 accidents. ***(General Dynamics)***

The fourth prototype, 63-9769, with dummy Phoenix missiles under the wings. Although the Air Force initially showed interest in the Phoenix system, which was also scheduled for use on the Navy's F-111B, it later discontinued development of the missiles for its F-111s. ***(General Dynamics)***



Rear view of the same aircraft. Note the position of the horizontal stabilizers, and the unusual parachute housing attached to the tail and used for spin tests. ***(General Dynamics)***

GENERAL ARRANGEMENT



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2. ECM ANTENNAS
3. COUNTERMEASURES DISPENSER
4. ARRESTING HOOK
5. SURFACE POSITION TRANSMITTERS (4)
6. HF ANTENNA (DORSAL FIN AND VERTICAL FIN LEADING EDGE)
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53. TAIL BUMPER DASHPOT

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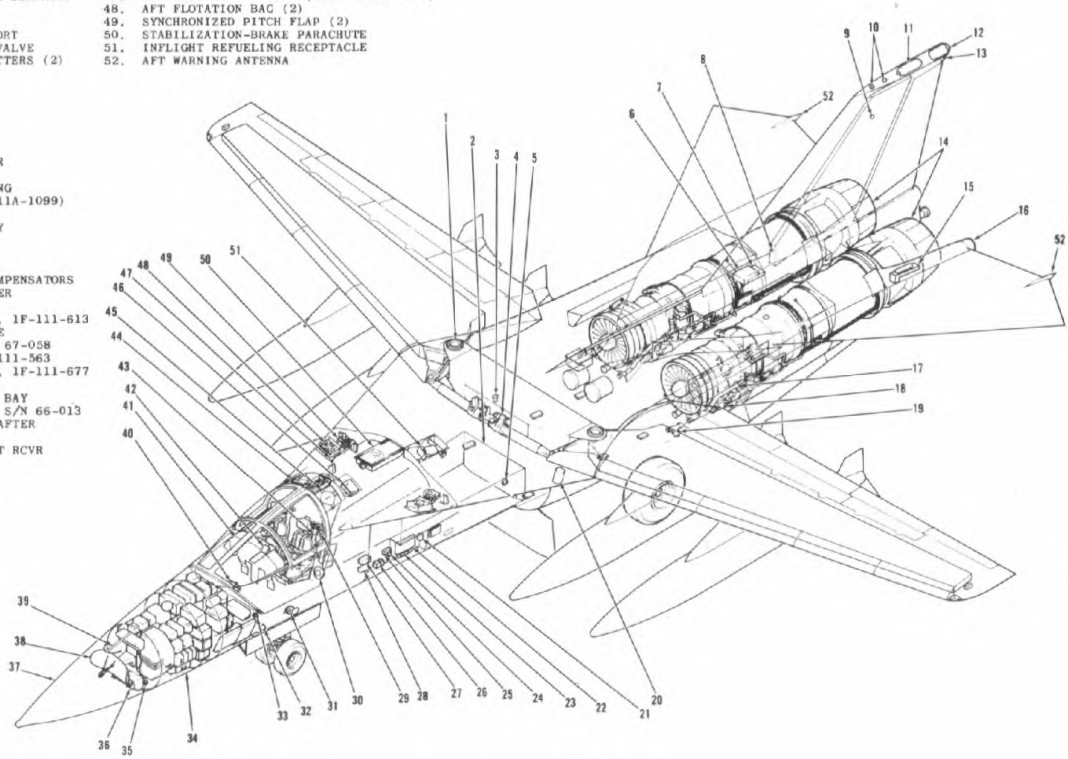
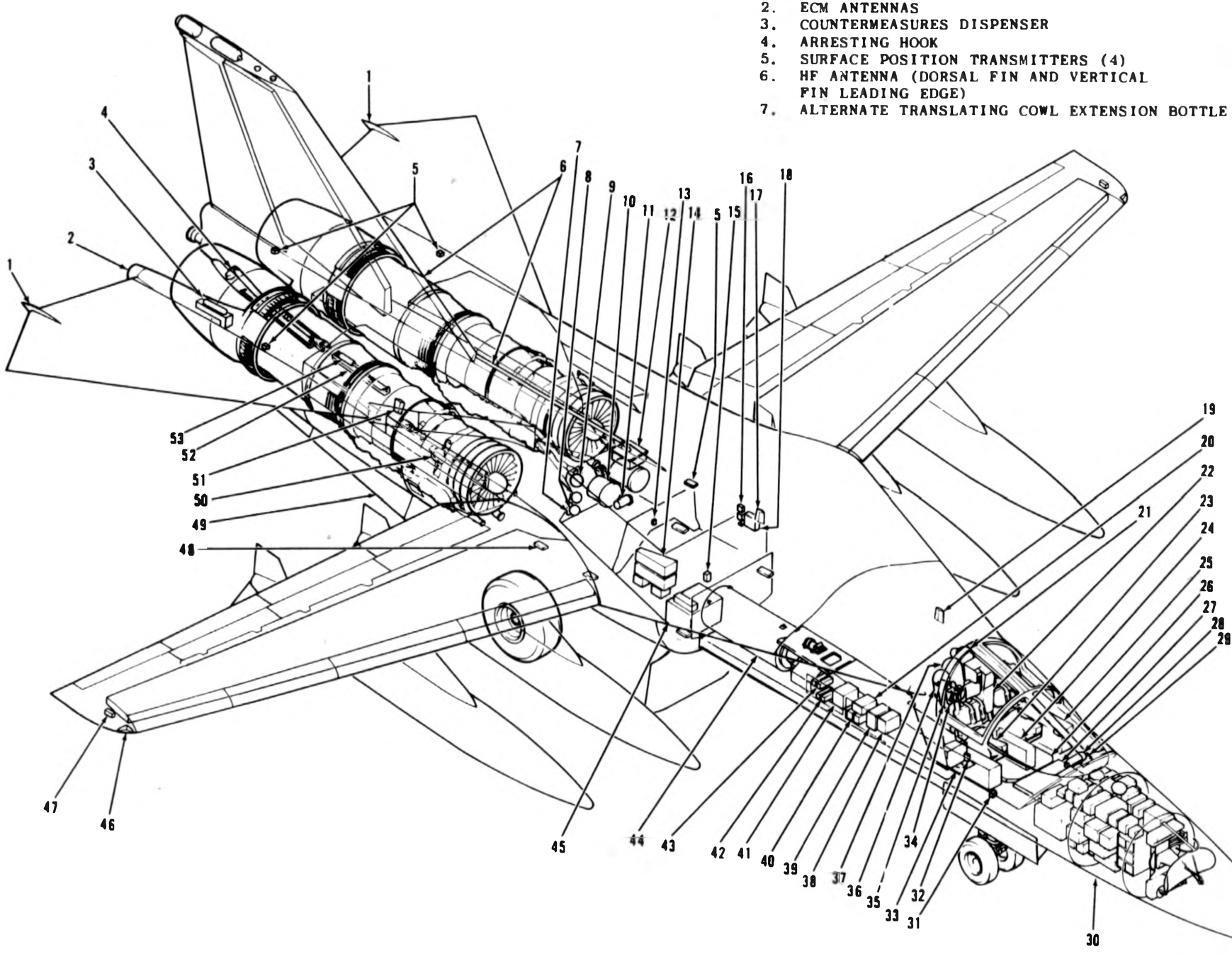


Courtesy of the U.S.A.F.



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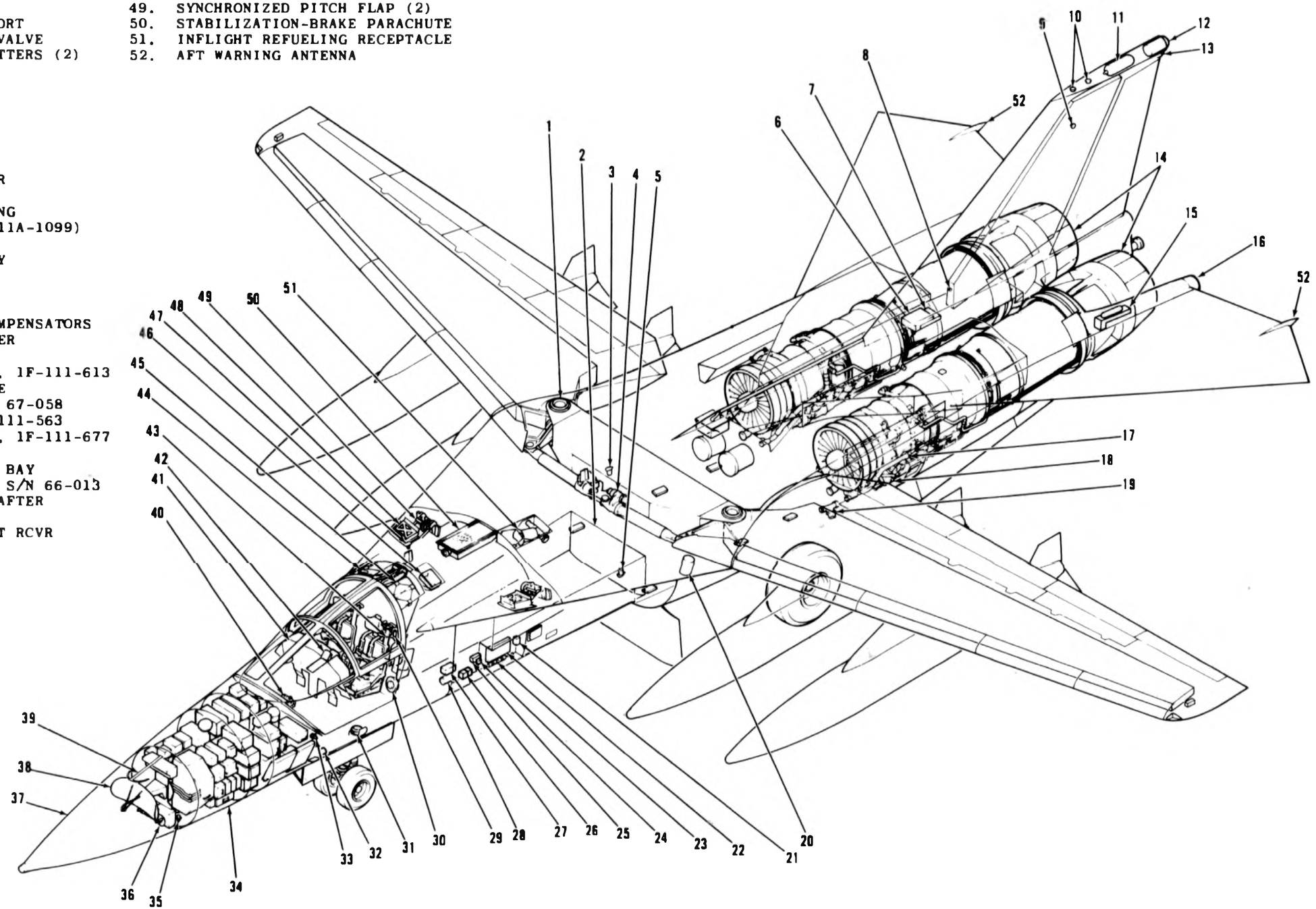


loss rate of any combat aircraft in Southeast Asia. It did so without the "Iron Hand" ECM aircraft or the tankers required by the F-4s. They often flew in weather that grounded every other aircraft in Vietnam, and in many instances flew single aircraft missions. Four F-111As could deliver the bomb loads of twenty F-4s, and, coupled with the fact that the support aircraft needed by F-4s were not needed by the F-111s, this resulted in a substantial cost savings. More importantly, far fewer lives of U.S. air crews were exposed to the enemy.

The F-111 program was and is full of ironies. McNamara's idea of commonality went to the other extreme. With the production cutbacks, only one wing operates the F-111A today. One operates the F-111D, one the F-111E, and one the F-111F. Each wing has to get or provide its own special support for the particular needs of its own version. When attrition reduces the spares below wing strength, it is likely that a wing will find itself receiving different versions of the F-111 than it usually operates. The fewer aircraft you have to support and maintain, the more expensive per aircraft it becomes. Even with the FB-111, there are only two wings presently operational.

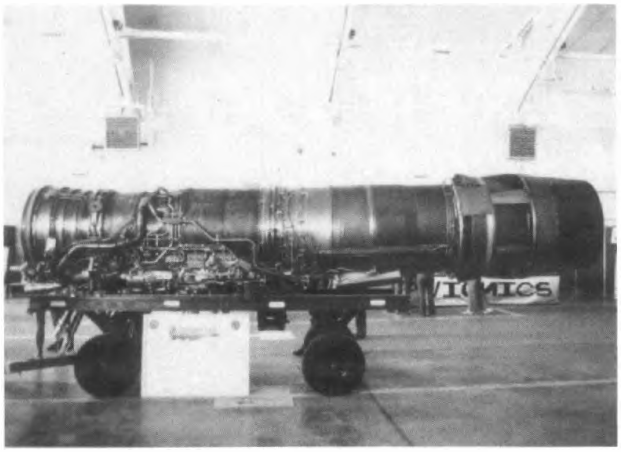
Another irony of the F-111 concerns Grumman. After suffering through the agony of trying to make the F-111 submit to Navy weight requirements, Grumman was probably delighted to see the F-111B cancelled so that it could begin work in earnest on the design that was to become the F-14 Tomcat. It is doubtful that anyone at Grumman ever wanted to see the F-111 again. But it is now Grumman who is the prime contractor for the EF-111A tactical jamming system. They were chosen for this program because of their experience with the EA-6B Prowler. Grumman is undoubtedly pleased to be working on the F-111 again, but who would have ever thought so after their earlier experience with the F-111B?

When Jimmy Carter cancelled the B-1 bomber, another version of the F-111 received attention. The B-52, now so dangerously old, is still the primary bomber for the U.S. Air Force as it has been since the mid-fifties. Because of poor planning in the Kennedy and Johnson administrations, a replacement for the B-52 just never materialized, and by the time the B-1 was developed, it was thought to be too costly. Alternatives were sought, one of which was the FB-111H. This aircraft was to be a much enlarged version of the F-111, and indeed it would bear little resemblance to other F-111s from the crew module aft, had it ever been built. Since it was never built, there are no details of it to photograph, and thus it falls outside the scope of this Detail & Scale book.

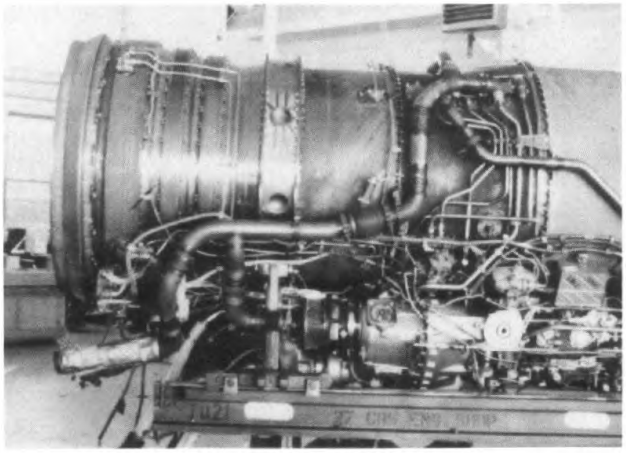
In conclusion of this developmental history of the F-111, it must be admitted that the program did have its problems, many of which should have been expected. But the biggest problems were those of mismanagement at the highest levels of the government, and unjustified criticism on the part of a press that did not have the expertise to know what it was talking about. The problems with the aircraft itself were small by comparison! Was the F-111 program a success? The answer depends on how one measures success. In meeting the unrealistic goals set for it by the Secretary of Defense to be everything to all people, it was a complete disaster. But as a strike and interdiction aircraft that is able to operate in all weather - the type of aircraft the Air Force wanted in the first place - it is an unqualified success.

FB-111A closing in on a tanker for in-flight refueling. Note the open refueling receptacle on the top of the aircraft. Except for the F-111B, all F-111s refuel in flight at this location. ***(Linn)***

TF30 ENGINE



TF30-P-9 engine removed from an F-111D.
(Jackson)



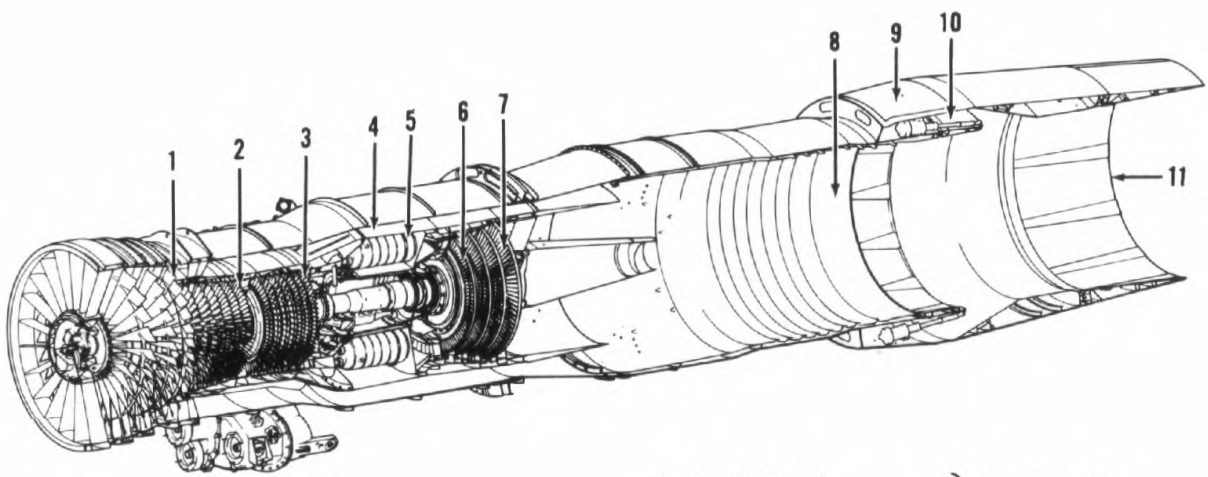
Close-up of forward end of the TF30-P-9 engine.
(Jackson)

All versions of the F-111 are powered by the Pratt & Whitney TF30 engine. However each version has a different variant of the engine except for the F-111A, C, and E which share the TF30-P-3. The F-111B was to use the TF30-P-12 which was more powerful, and was developed into the P-9 which powers the F-111D. The F-111F is fitted with the P-100 while the FB-111 uses the P-7. What this means is that there are four different versions of the engine presently in use in the relatively small F-111 fleet. While many parts are common to all, or at least more than one version, others are not, and this makes the support problem more difficult than it would be if the same engine were used in all versions.

The TF30 caused early problems with the F-111, and several crashes resulted. Changes were made to both the engine and the intake design. The problems were not unexpected since the TF30 was the first turbofan fitted with an afterburner. Anytime something new is tried, problems will have to be ironed out.

Another problem caused by the engine was price escalation. The price of the F-111A airframe actually decreased, but the cost of the engine about tripled.

All this notwithstanding, a lot was learned from the development of the TF30, and F-111s operational today, when flown properly, experience no major engine problems.

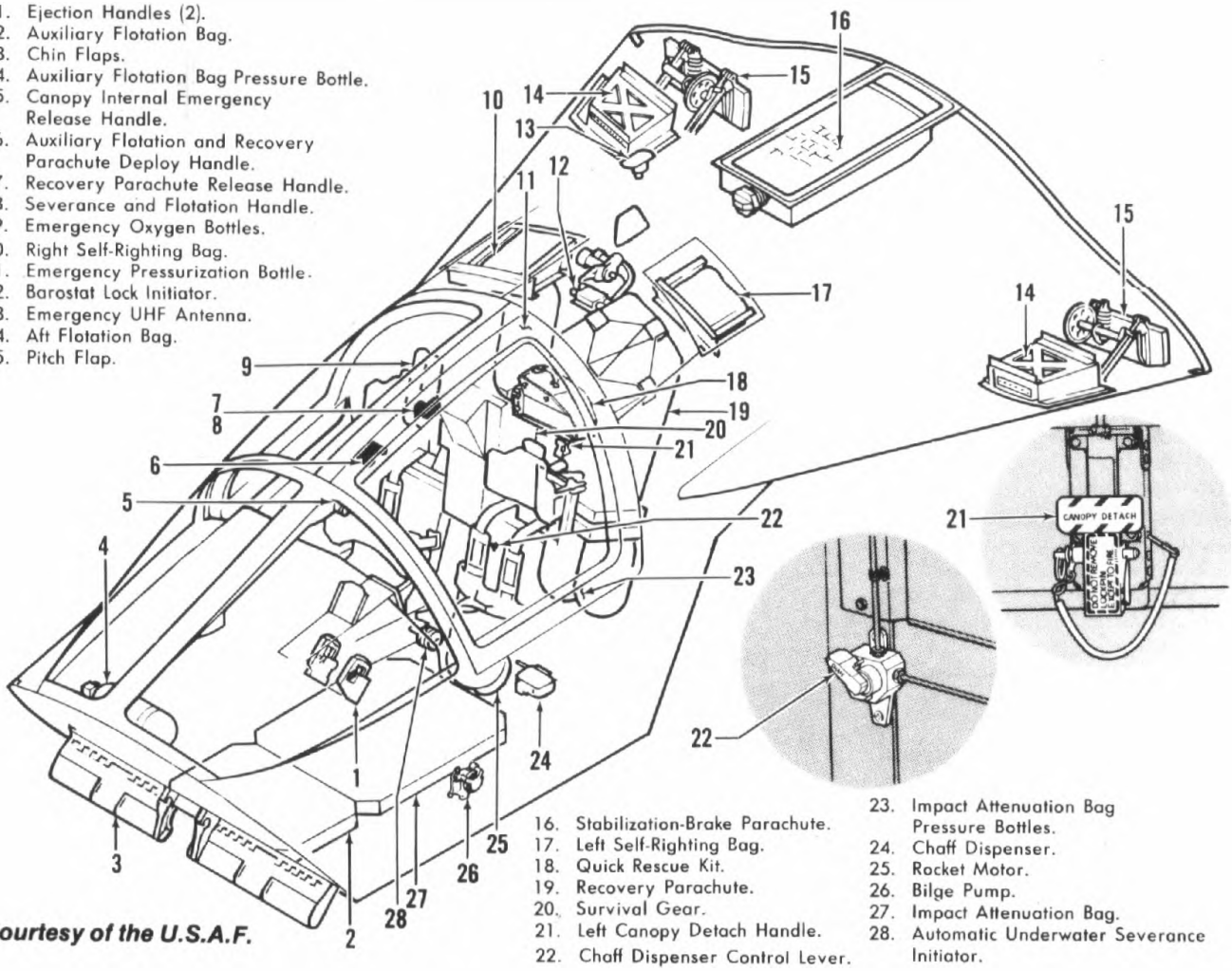


Courtesy of the U.S.A.F.

1. Fan (3 Stages). } Low Pressure
2. N1 Compressor (6 Stages). } Compressor
3. N2 Compressor (7 Stages).
4. Fan Duct.
5. Combustion Chambers (8).
6. N2 Compressor Turbine (Single Stage).
7. Fan and N1 Compressor Turbine (3 Stages).
8. Afterburner Section.
9. Free Floating Blow-in Doors.
10. Variable Nozzle.
11. Tail Feathers.

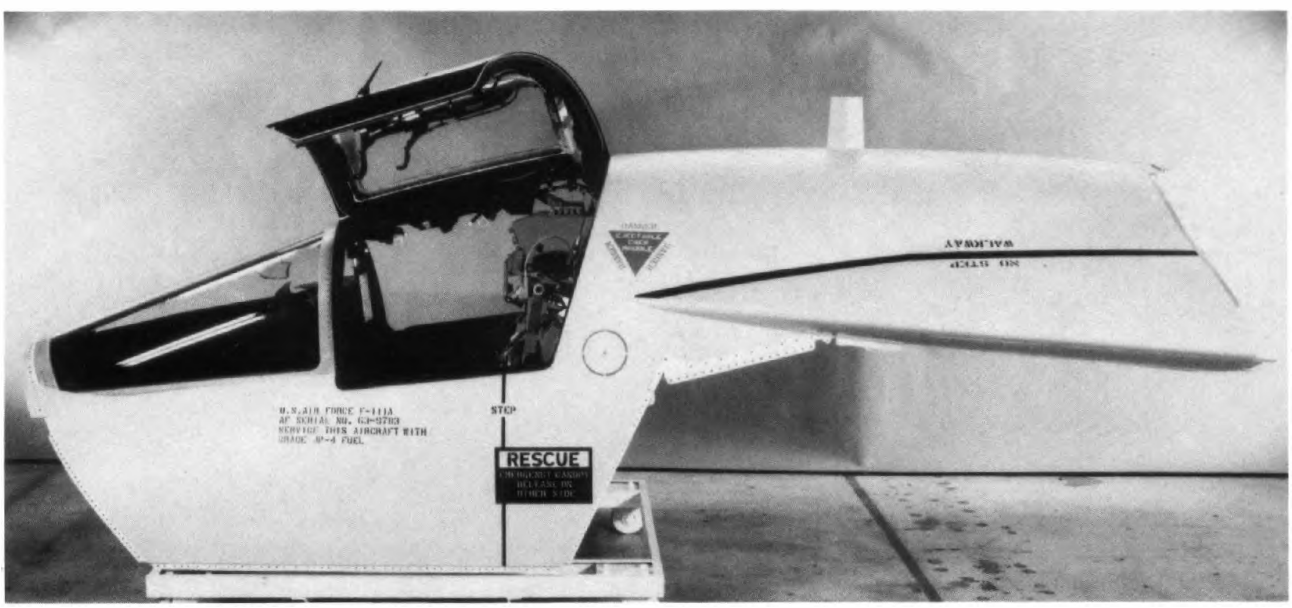
Crew Module General Arrangement

1. Ejection Handles (2).
2. Auxiliary Flotation Bag.
3. Chin Flaps.
4. Auxiliary Flotation Bag Pressure Bottle.
5. Canopy Internal Emergency Release Handle.
6. Auxiliary Flotation and Recovery Parachute Deploy Handle.
7. Recovery Parachute Release Handle.
8. Severance and Flotation Handle.
9. Emergency Oxygen Bottles.
10. Right Self-Righting Bag.
11. Emergency Pressurization Bottle.
12. Barostat Lock Initiator.
13. Emergency UHF Antenna.
14. Aft Flotation Bag.
15. Pitch Flap.



Courtesy of the U.S.A.F.

16. Stabilization-Brake Parachute.
17. Left Self-Righting Bag.
18. Quick Rescue Kit.
19. Recovery Parachute.
20. Survival Gear.
21. Left Canopy Detach Handle.
22. Chaff Dispenser Control Lever.
23. Impact Attenuation Bag Pressure Bottles.
24. Chaff Dispenser.
25. Rocket Motor.
26. Bilge Pump.
27. Impact Attenuation Bag.
28. Automatic Underwater Severance Initiator.

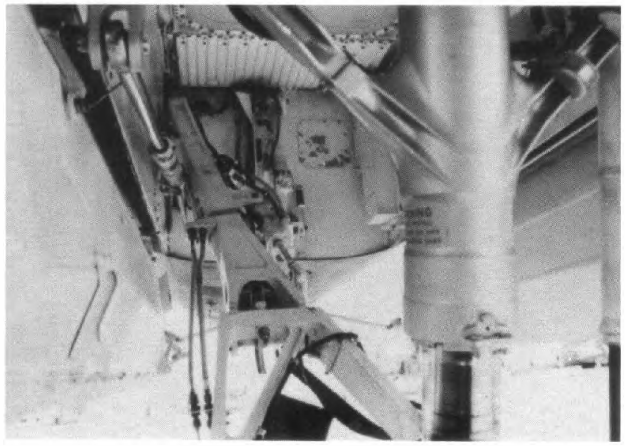


Unlike other military aircraft, the F-111 does not have ejection seats. Instead, the crew is ejected to safety in an enclosed module by means of a rocket motor. The module has flotation bags for a water landing, a bilge pump, its own chaff dispenser, and survival gear. ***(General Dynamics)***

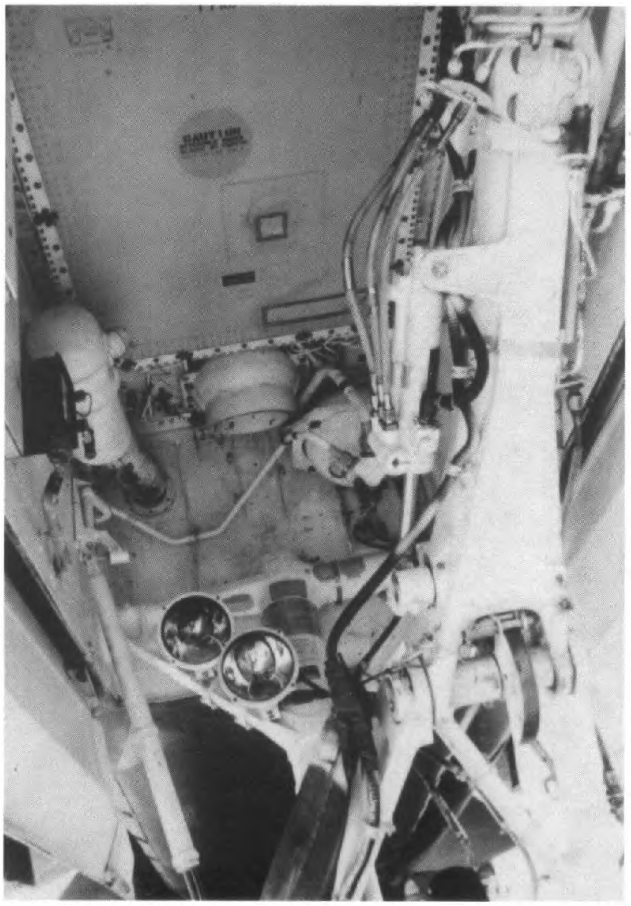
NOSE LANDING GEAR DETAIL

Nose gear from front. *(Grumman)*

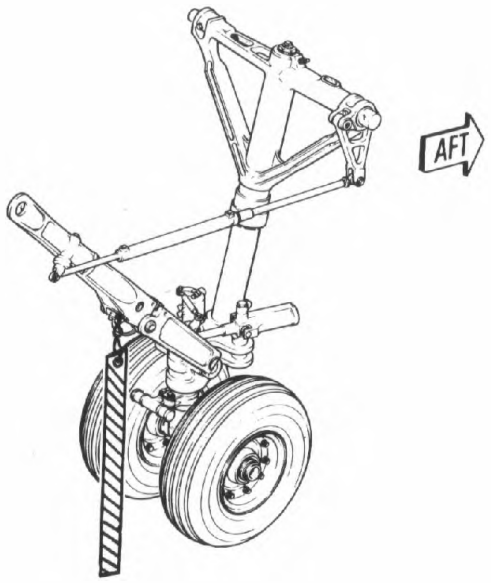
Nose gear from behind and to the left.(Grumman)



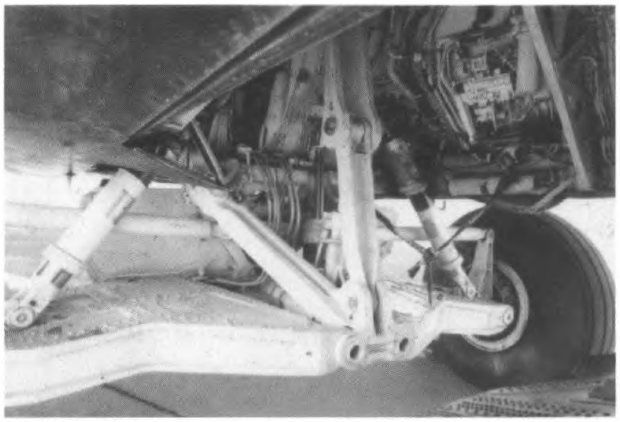
Nose gear well looking forward. Notice how the forward brace goes off to the left side of the well rather than being centered.



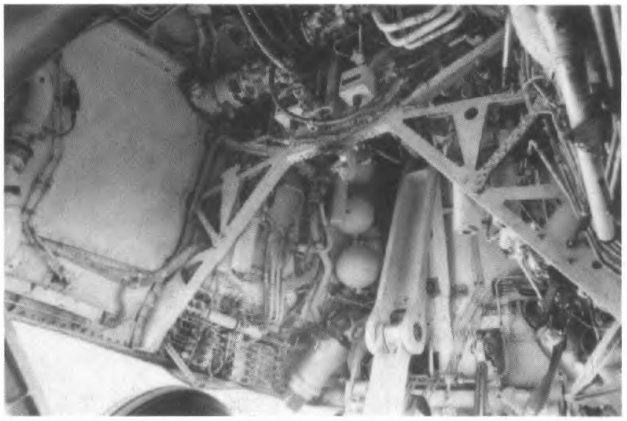
Nose gear well looking aft. The rocket motor for the crew module escape system is located at the center aft end of the well.



MAIN LANDING GEAR DETAIL



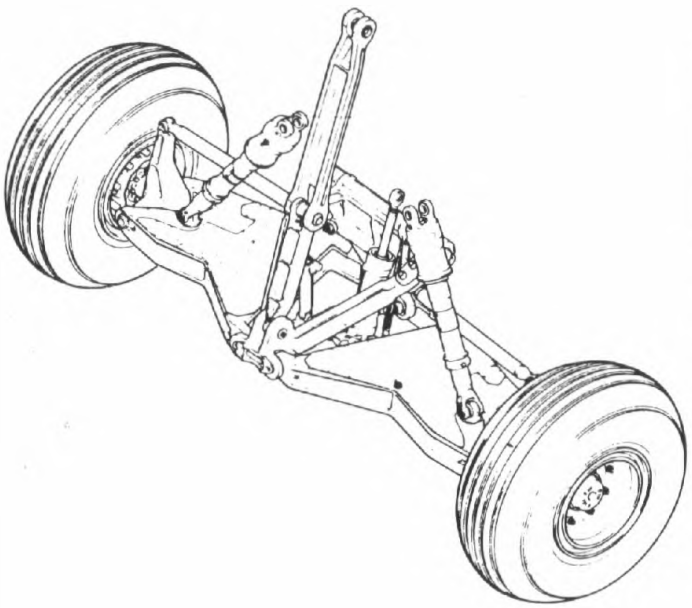
Main gear structure as viewed from the front.

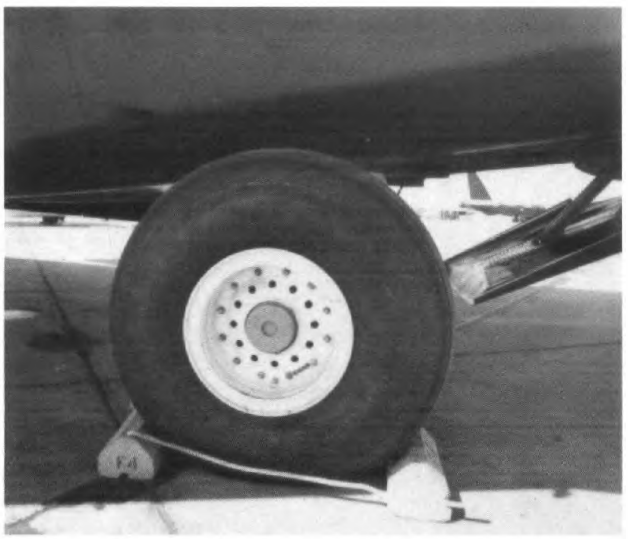


Main gear well looking aft.

Forward main landing gear door which doubles as a speed brake.

Rear main landing gear door from behind.





Right main wheel and tire on an F-111A.

F-111A & E

F-111A, 67-0081, of the 347th TFW. *(via Rotramel)*

The first 18 F-111As were all RDT&E aircraft, and had several noticeable differences from later production aircraft. They were powered by TF-30-P-1 engines rather than the P-3 that would later power the production F-111As.

The first flight of an RDT&E F-111A was made from Carswell AFB, Texas on December 21, 1964, exactly two years after the procurement had been initiated. Flight testing revealed engine problems in the form of compressor stalls, particularly at high speed and high angles of attack. To correct the problem, the P-3 engine was introduced, and the engine inlet was redesigned with the incorporation of a new air diverter. This design was known as Triple Plow I. While this helped the problem, it did not cure it, and this eventually led to the Triple Plow II and the F-111E.

One RDT&E aircraft was tested with a reconnaissance pallet that was removable so that the aircraft could operate both as a combat aircraft and a reconnaissance aircraft. The Air Force had hoped to obtain a number of RF-111s, and the Australians had also expressed interest. But the pallet idea fell through because it took days instead of hours to install and remove.

The first two production F-111As first flew on February 12, 1967 with P-1 engines installed. The P-3 did not become available until after the first 30 aircraft had been fitted with the P-1. However, once available, the P-3 was retrofitted to most of these aircraft.

On October 16, 1967, F-111As were assigned to the 474th Tactical Fighter Wing, thus entering operational service. The F-111As were put through several evaluations with names like Combat Bullseye I, Harvest Reaper, Combat Trident, and finally Combat Lancer which was the F-111s initial test in combat over Southeast Asia. Combat Lancer was conducted during March and April 1968, and experienced three combat losses before being halted. This evaluation was conducted before the initial operational capability of any F-111 unit, which did not occur until April 28, 1968, when the 428th TFS of the 474th TFW reached operational status.

F-111As were redeployed to SEA in late September of 1972, and this time they compiled an outstanding record of success in battle.

The British ordered a version of the F-111A which was designated the F-111K. In January 1968, the British cancelled the F-111K, and most airframes were modified to FB-111s as described in the section on that version. The Australian F-111C is practically identical to an F-111A, and today some F-111As are getting a new lease on life as EF-111As.

Following the F-111A in terms of availability to the Air Force was the F-111E. Essentially this aircraft, like the F-111K, F-111C, and EF-111A, was a modified F-111A. The only major differences between the -A and -E were the Triple Plow II intakes (a further attempt to solve the engine compressor stall problem), and minor avionics changes.

The first F-111E made its maiden flight on August 20, 1969, and entered operational service with the 27th TFW at Cannon AFB (now with F-111Ds). Today the F-111E is assigned to the 20th TFW at Upper Heyford, England.

Both the F-111A and F-111E had Radar Homing and Warning gear (RHAW) installed, and were the first Air Force aircraft so equipped from the beginning.

A total of 158 F-111As were built counting 17 of the 18 RDT&E aircraft (the 18th being charged to the FB-111 program). These were then followed by 94 F-111Es.

F-111A & E TECHNICAL DATA

Development

Official Program "Go-Ahead"	Sep 61
Contractor Selected	Nov 62
Date of Contract	Dec 62
Mock-up Completed	Sep 63
Roll-out	Oct 64
First Flight	Dec 64
First Acceptance (Production)	Apr 67
First Service Use	Oct 67
Production Completed	Aug 69
Total Production Aircraft Contracted For	141

POWER PLANT

No. & Model	(2) TF30-P-3
Mfr	Pratt & Whitney
Engine Spec No.	A-26691
Type	Twin Spool, Turbofan
Length	241.7 in
Diameter (compressor face)	38.12 in
Weight (dry)	4062 lb
Nozzle	Variable Area, Blow-in Door Ejector
Augmentation	Afterburning

FUEL

Location	No. Tanks	Gal
Wg, int	2	778
Fus, fwd	1	2808
Fus, aft	1	1429
Fuel Lines	-	28
Wg, ext, drop	*4	2400
	Total	7443

*Combinations of loading modes allow only 4 of 6 tanks to be carried.

Grade	JP-4
Specification	MIL-T-5624

OIL

Engine	4 gal/eng	(tot) 8
Specification	MIL-L-7808	

WEIGHTS

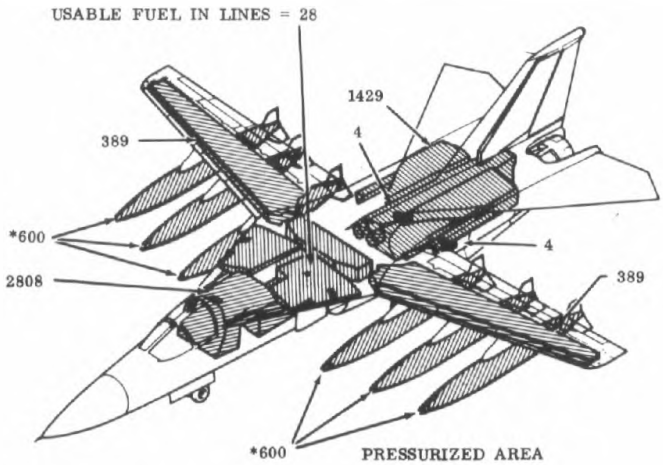
Loading	Lb	L.F.
Empty	46,172(C)	
Basic	49,310(C)	
Design	70,000	7.33
Combat	*59,620	
Max T.O. (overload)	†98,850	4.67
Max T.O. (normal)	‡91,300	5.05
Max Land	††72,000	

(C) Calculated
* For Basic Mission
† Limited by gear strength
‡ Limited by performance
†† 8 ft/sec rate of sink

ENGINE RATINGS

S.L. Static	LB	-	RPM	-	MIN
Max:	*18,500	-	14,400	-	45
Intermed:	10,750	-	14,350	-	45
Max Cont:	9800	-	14,030	-	Cont

* With afterburner operating

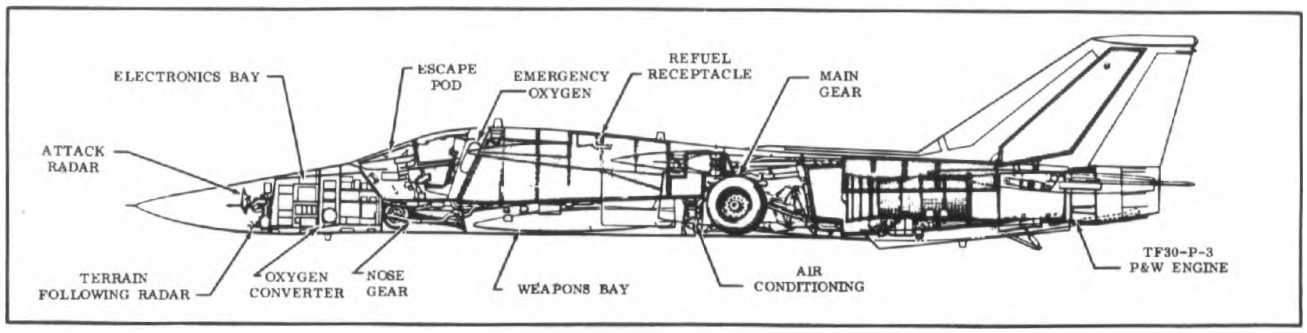


*Combination of loading modes allow only 4 of 6 tanks to be carried. The 2 outboard tanks are not authorized in combination with inboard tanks.

Fuel (Gal) Oil (Gal)

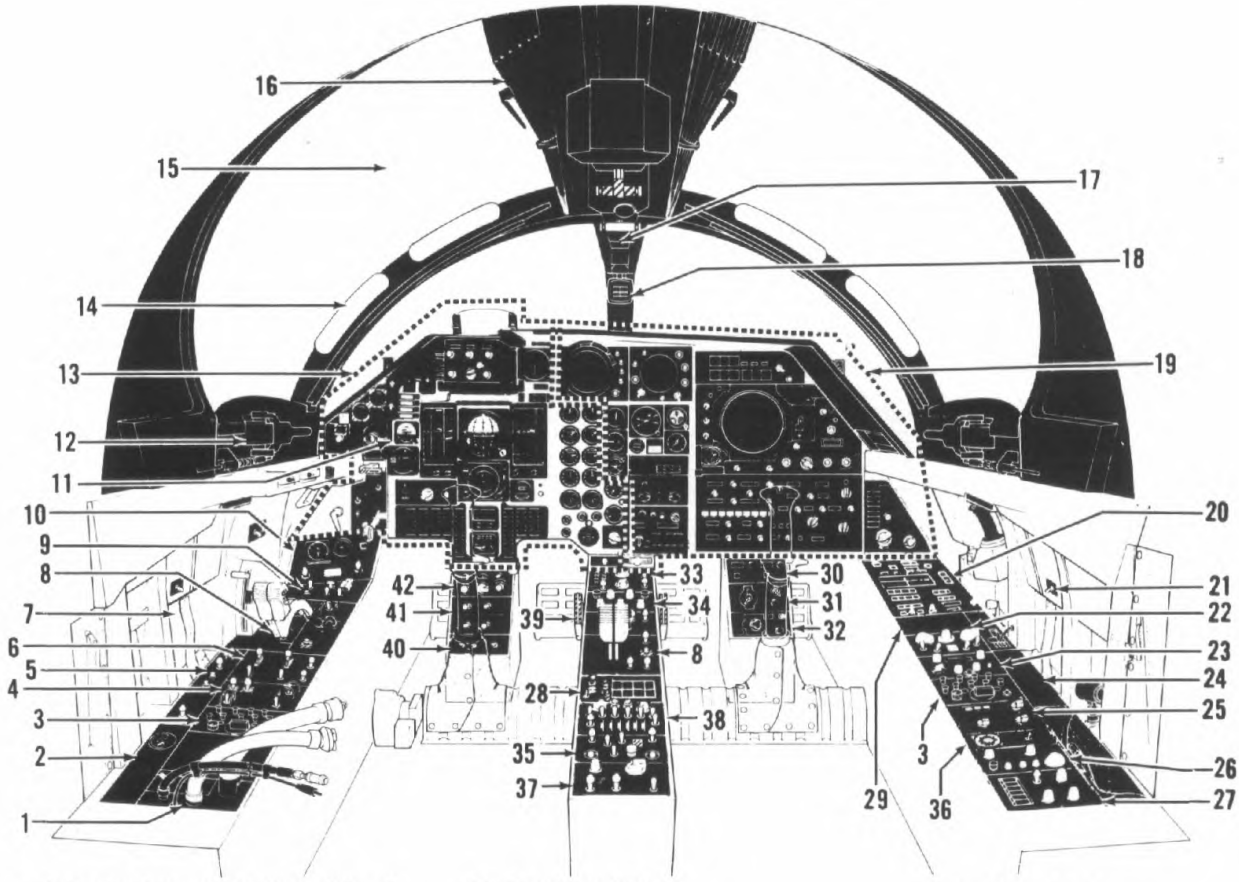
ELECTRONICS

Mission & Traffic Control	
UHF Command Radio	AN/ARC-109
HF Radio	AN/ARC-112
Interphone	AN/AIC-25
IFF (AIMS)	AN/APX-64
ILS	AN/ARN-58
TACAN	AN/ARN-52
UHF DF	AN/ARA-50
Penetration Aids	
ECM	AN/ALQ-94
IR Receiving Set	AN/AAR-34
RHAWS	AN/APS-109A
CMRS	AN/ALR-23
CMDS	AN/ALE-28
ECM Pods (2)	AN/ALQ-87
ECM Pods (2)	AN/ALQ-101
Fire Power Control	
Inertial Bomb Nav Sys	AN/AJQ-20A
Optical Display Sight	AN/ASG-23
Attack Radar	AN/APQ-113
Radar Altimeter	AN/APN-167
Terrain Following Radar	AN/APQ-110
Photographic Equipment	
Strike Camera	KB-18A

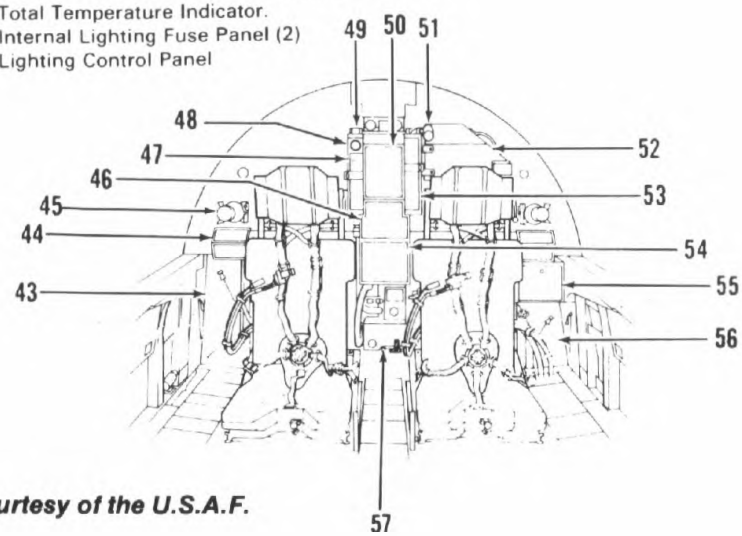


Courtesy of the U.S.A.F.

F-111A COCKPIT

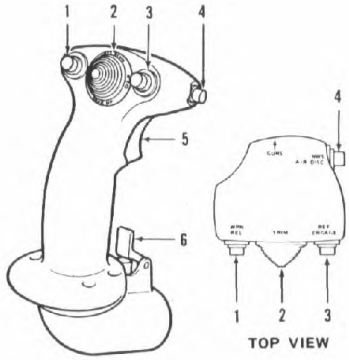


1. Left Station Oxygen-Suit Control Panel
2. Electrical Power Test Panel
   Oxygen Gage Panel
3. Interphone Panel (2)
4. Auxiliary Flight Control Panel
5. Flight Control Switch Panel
6. Autopilot Damper Panel
7. Left Sidewall
8. Throttle Panel (2)
9. Miscellaneous Switch Panel
10. Auxiliary Gage Panel
11. Self Contained Attitude Indicator
12. Internal Canopy Latch Handles (2).
13. Left Main Instrument Panel
14. Mirrors (4).
15. Canopy.
16. Thermal Curtain (2).
17. Canopy Center Beam Assembly.
18. Magnetic Compass.
19. Right Main Instrument Panel
20. Armament Select Panel
    Weapons Control Panel
21. Right Sidewall
22. Attack Radar Control Panel
23. HF Radio Control Panel
24. Strike Camera Control Panel
25. ECM Control Panel.
26. CMRS Control Panel.
27. CMDS Control Panel.
28. ECM Pod Control Panel.
29. Closeout Panel.
30. Burst Control Panel
31. TACAN Control Panel
32. ILS Control Panel
33. Fuel Control Panel
34. TFR Control Panel
35. Electrical Control Panel
36. Scope Camera Control Panel
37. Air Conditioning Control Panel
38. IFF Control Panel
39. Ejection Handles (2).
40. Antenna Select Panel
41. Windshield Wash/Anti-Icing Control Panel
42. Compass Control Panel
43. Hood Stowage Compartment.
44. Air Diffusers (2).
45. Liquid Containers (2).
46. Circuit Breaker Panel
47. Letdown Chart Stowage Compartment.
48. Total Temperature Indicator.
49. Internal Lighting Fuse Panel (2)
50. Lighting Control Panel
51. Utility Light.
52. Quick Rescue Kit.
53. Approach Chart Holder
    Stowage Compartment.
54. Ground Check Panel
55. Food Stowage Compartment.
56. Relief Container Stowage
    Compartment (2).
57. Right Station Oxygen Suit
    Control Panel



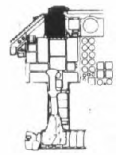
Courtesy of the U.S.A.F.

Control Sticks

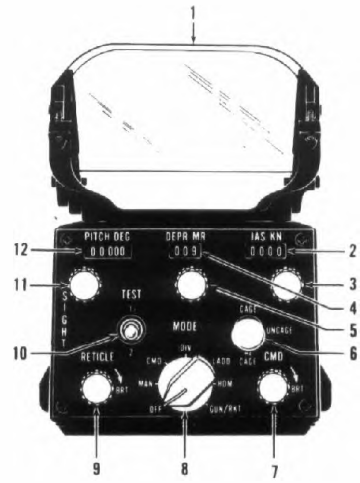


1. Weapon Release Button.
2. Trim Button.
3. Reference Engage Button.
4. Aerial Refuel and Nose Wheel Steering Button.
5. Gun Trigger.
6. Autopilot Release Lever.

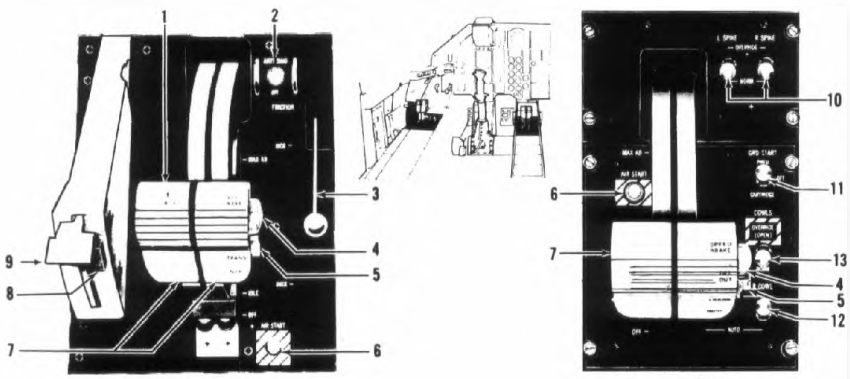
Lead Computing Optical Sight and Control Panel



1. Optical Sight.
2. Preset Indicated Airspeed Indicator.
3. Indicated Airspeed Set Knob.
4. Reticle Depression Indicator.
5. Reticle Depression Set Knob.
6. Aiming Reticle Cage Lever.
7. Command Bar Brightness Knob.
8. Mode Select Knob.
9. Aiming Reticle Brightness Knob.
10. Test Switch.
11. Pitch Degree Set Knob.
12. Pitch Degree Indicator.

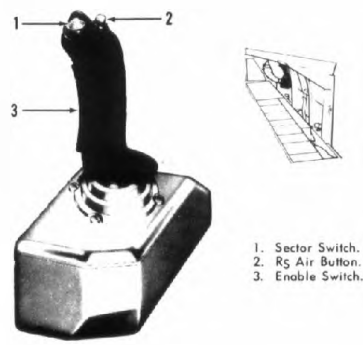


Throttle Panels



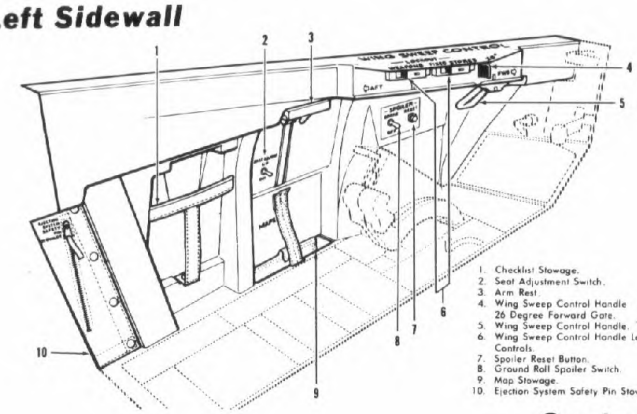
1. LCOS Cage Button.
2. Anti-Skid Control Switch.
3. Throttle Friction Lever.
4. Speed Brake Switch.
5. Microphone Switch.
6. Air Start Button.
7. Throttles.
8. Flap/Slat Handle Gate Release.
9. Flap/Slat Handle.
10. Spike Control Switches.
11. Engine Ground Start Switch.
12. Translating Cowl Switches.
13. Translating Cowl Emergency Override Switch.

Attack Radar Tracking Control Handle



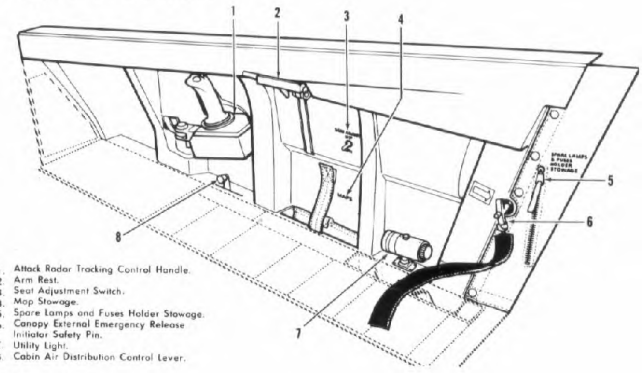
1. Sector Switch.
2. RS Air Button.
3. Enable Switch.

Left Sidewall



1. Checklist Stowage.
2. Seat Adjustment Switch.
3. Arm Rest.
4. Wing Sweep Control Handle 26 Degree Forward Gate.
5. Wing Sweep Control Handle.
6. Wing Sweep Control Handle Lockout Controls.
7. Spoiler Reset Button.
8. Ground Roll Spoiler Switch.
9. Map Stowage.
10. Ejection System Safety Pin Stowage.

Right Sidewall

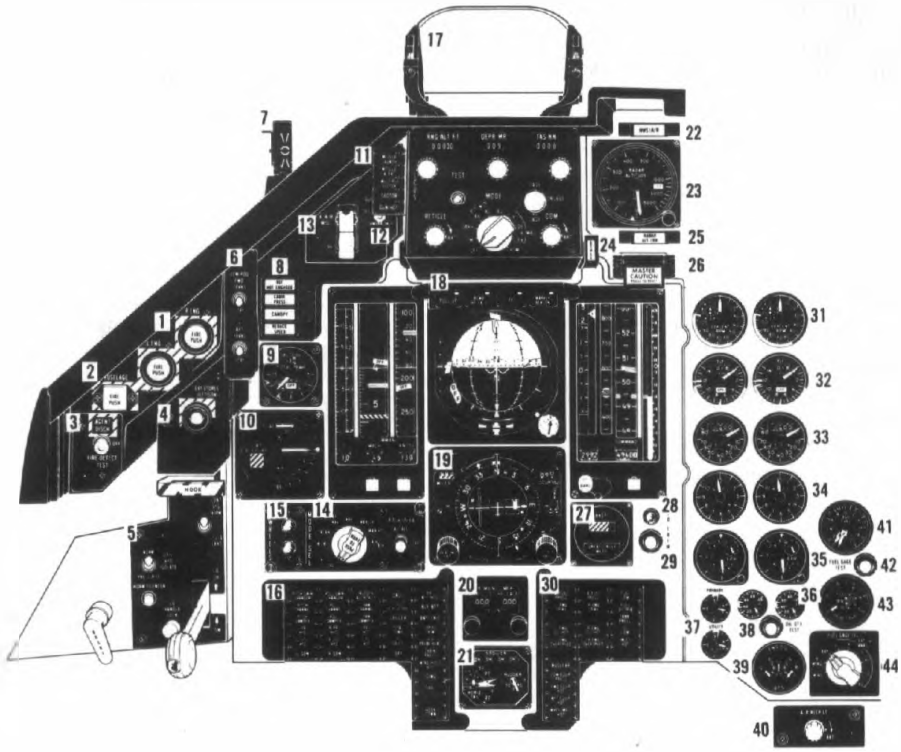


1. Attack Radar Tracking Control Handle.
2. Arm Rest.
3. Seat Adjustment Switch.
4. Map Stowage.
5. Spare Lamps and Fuses Holder Stowage.
6. Canopy External Emergency Release Initiator Safety Pin.
7. Utility Light.
8. Cabin Air Distribution Control Lever.

Courtesy of the U.S.A.F.

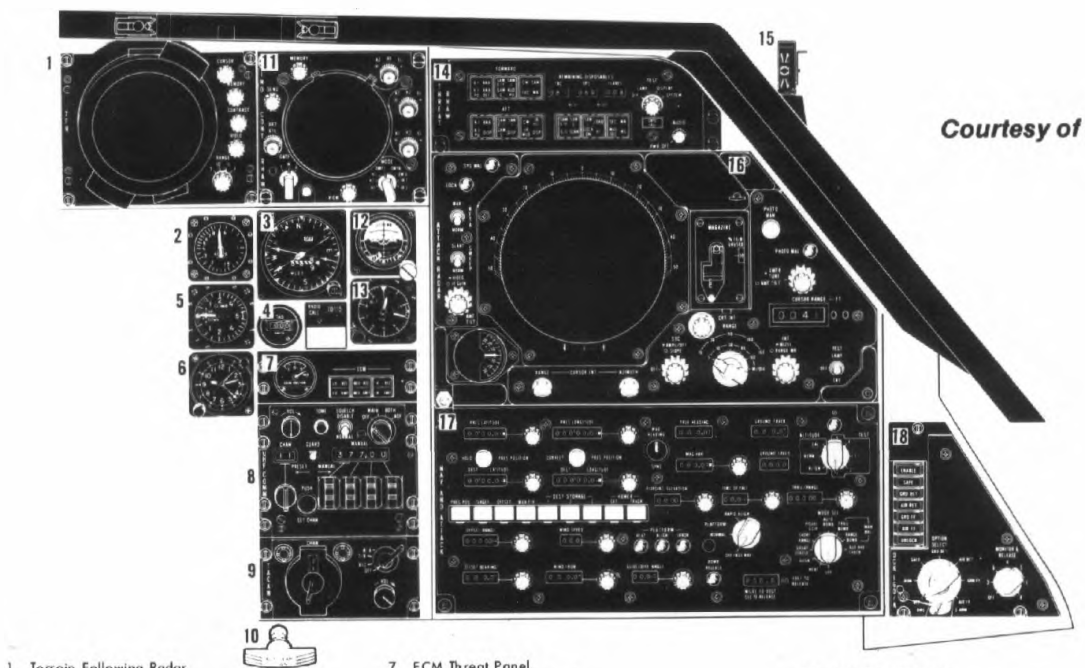
F-111E INSTRUMENT PANEL

Left Main Instrument Panel



1. Engine Fire Pushbutton Warning Lamps.
2. Fuselage Fire Pushbutton Warning Lamp.
3. Agent Discharge/Fire Detect Test Switch.
4. External Stores Jettison Button.
5. Landing Gear Control Panel
6. ECM Pod Transmit Control Switches.
7. Angle-of-Attack Indexer.
8. Left Warning and Caution Panel.
9. Total Temperature Indicator.
10. Wing Sweep Flap/Slat Position Indicator.
11. Upper Warning and Caution Panel.
12. Gun/Camera Control Switch.
13. Air/Air IR Missile Switch.
14. Instrument System Coupler Control Panel.
15. Landing Gear Position Indicator Lamps.
16. Left Main Caution Lamp Panel.
17. Lead Computing Optical Sight and Control Panel,
18. Upper Warning and Caution Lamp Panel.
19. Integrated Flight Instruments,
20. Dual Bombing Timer,
21. Control Surface Position Indicator.
22. Nosewheel Steering/Air Refueling Indicator Lamp.
23. Radar Altimeter.
24. Stall Warning Lamp.
25. Radar Altitude Low Warning Lamp.
26. Master Caution Lamp.
27. Bomb Nav Distance Time Indicator.
28. Takeoff Trim Indicator Lamp.
29. Takeoff Trim Button
30. Right Main Caution Lamp Panel.
31. Engine Tachometers.
32. Engine Turbine Inlet Temperature Indicator.
33. Engine Fuel Flow Indicators.
34. Engine Nozzle Position Indicators.
35. Engine Pressure Ratio Indicators.
36. Engine Oil Pressure Indicators.
37. Hydraulic System Pressure Indicators.
38. Oil Quantity Indicator Test Button.
39. Oil Quantity Indicators.
40. Air Refueling Receptacle Lights Control Knob.
41. Fuselage Fuel Quantity Indicator.
42. Fuel Quantity Indicator Test Button.
43. Total/Select Fuel Quantity Indicator.
44. Fuel Quantity Indicator Selector Knob.

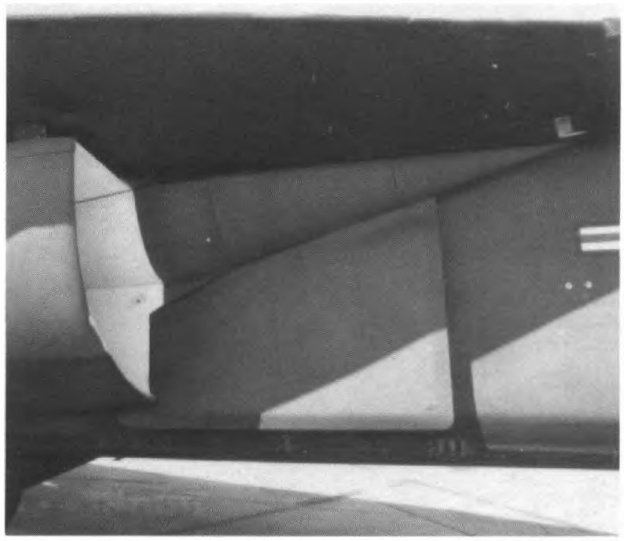
Right Main Instrument Panel

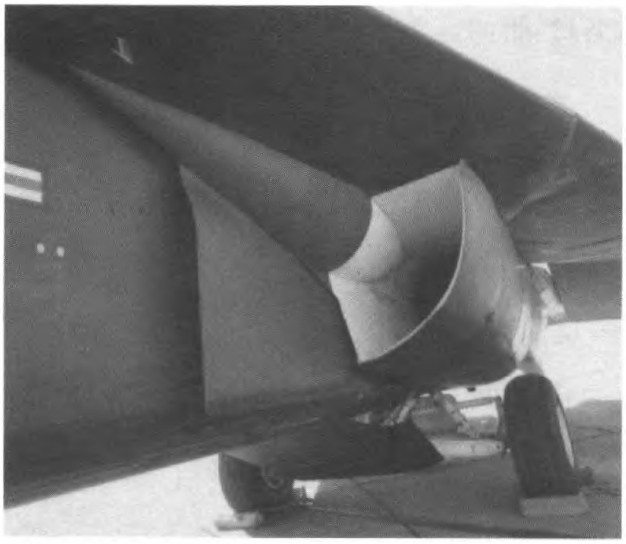


Courtesy of the U.S.A.F.

1. Terrain Following Radar Scope Panel.
2. Standby Airspeed Indicator.
3. Bearing-Distance-Heading Indicator.
4. True Airspeed Indicator.
5. Vertical Velocity Indicator.
6. Clock.
7. ECM Threat Panel.
8. VHF Radio Control Panel.
9. TACAN Control Panel.
10. Landing Gear Emergency Release Handle.
11. Radar Homing and Warning Scope Panel.
12. Standby Attitude Indicator.
13. Standby Altimeter.
14. Radar Homing and Warning Panel.
15. Angle-of-Attack Indexer.
16. Attack Radar Scope Panel.
17. Bomb Nav Control Panel
18. Nuclear Weapons Control Panel.

F-111 INTAKES





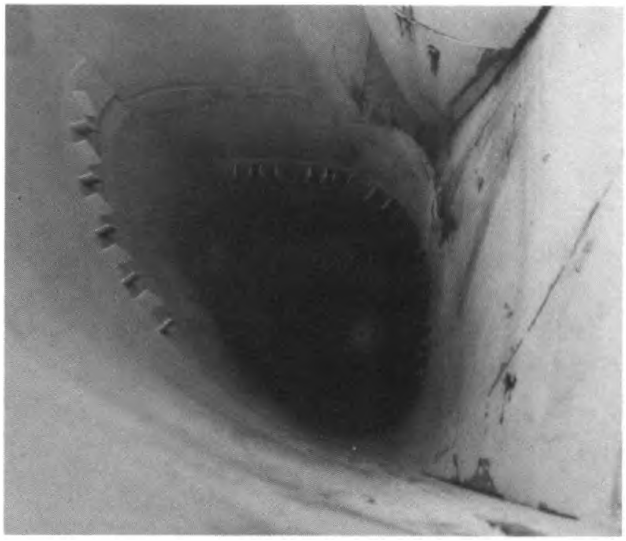
Above: Triple Plow I intake with blade as installed on an F-111A.

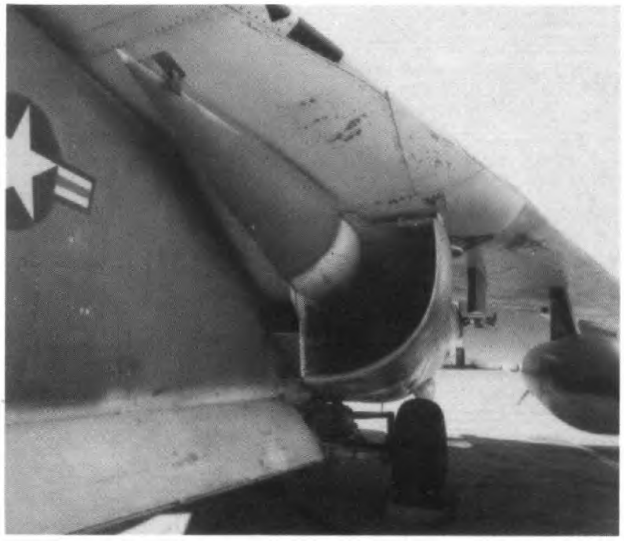
Above right: Another view of a Triple Plow I intake on the left side of an F-111A.

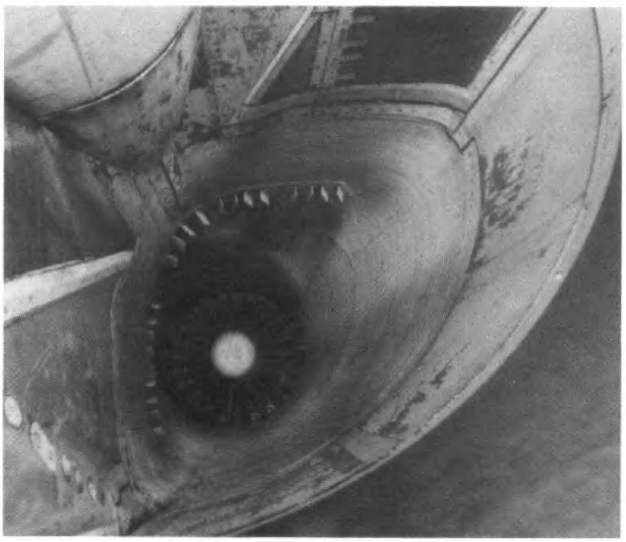
Right: Looking down an F-111A intake. Note the vortex generators.

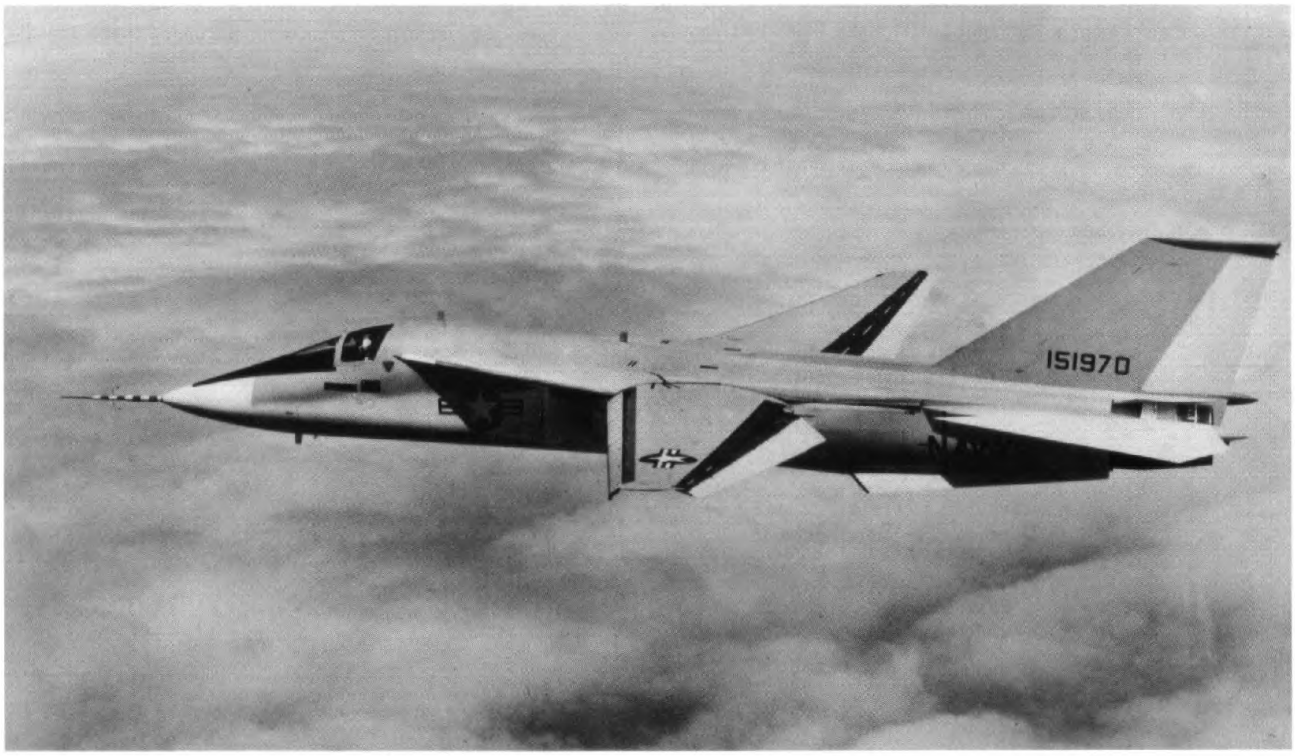
Below: Triple Plow II intake without the blade. Note how far away the cone is located from the fuselage.

Below right: Looking down the same intake as shown at left. Note the lack of vortex generators on the outer wall.









The first YF-111B in flight. *(Grumman)*

F-111B

In trying to comply with Secretary McNamara's concept of commonality, the F-111B was procured simultaneously with the first F-111As by the Air Force. There were five RDT&E aircraft which were followed by two production aircraft before cancellation of the program.

The F-111B was to carry the Phoenix missile system designed by Hughes, and as such would replace the planned F6D Missileer aircraft and Eagle missile system as the fleet defense interceptor. It differed from the F-111A with its shorter radome, longer wings, and more powerful P-12 engine. It had a large ventral fin housing a carrier arresting hook.

The first F-111B was a modified RDT&E F-111A, and it made its first flight from Grumman's facility at Peconic, New York on May 18, 1965. (Grumman had been assigned as contractor for the Navy's version of the F-111 in November 1963.)

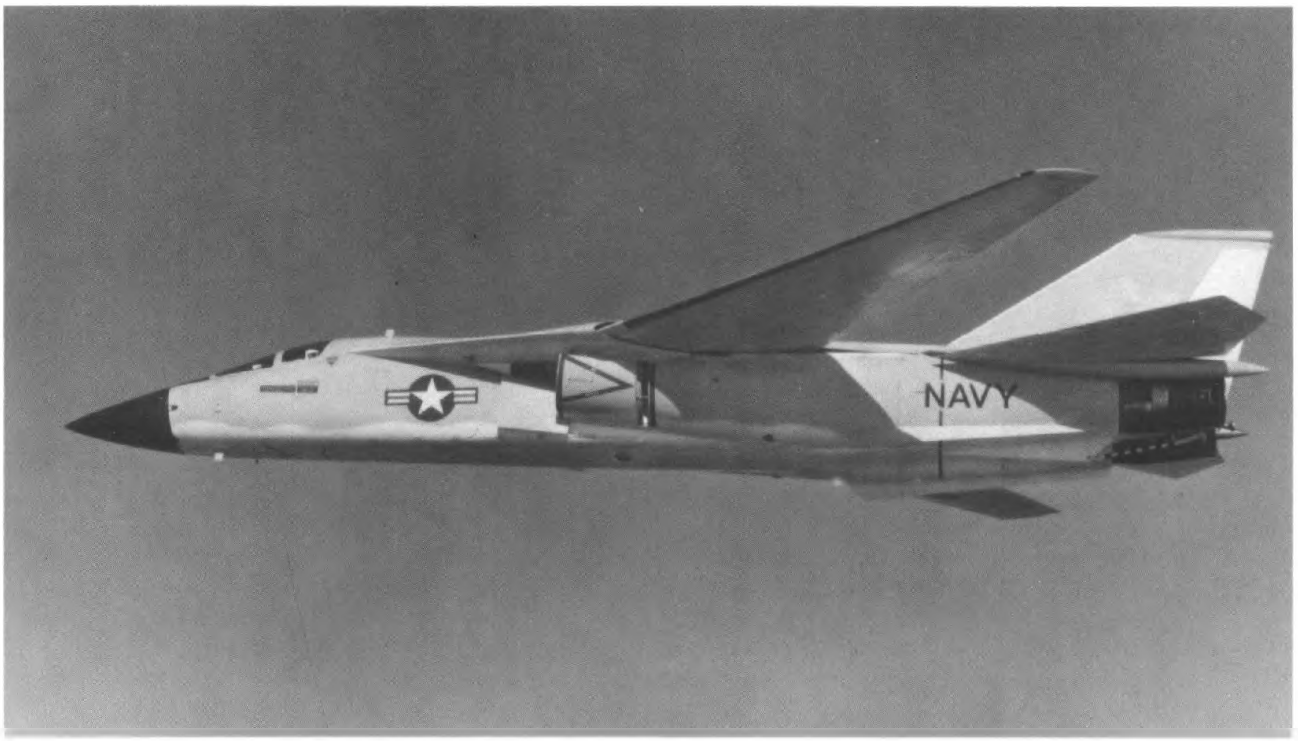
The biggest problem with the F-111B was trying to get the big aircraft down to the weight limits required by the Navy. The F-111B program went through a Super Weight Improvement Program (SWIP), then a Colossal Weight Improvement Program (CWIP) in stages I, II, and III. What this did was reduce commonality from eighty percent to less than thirty percent, thus eliminating McNamara's very reason for having the Air Force and Navy buy the same plane.

But weight was not the only problem with the F-111B. It suffered from the same engine compressor stalls as the F-111A, and the crew module did not provide enough visibility for safe carrier landings. A new module was authorized in March 1967, but this lessened the commonality factor even more.

Three of the F-111Bs were involved in crashes, and of these, two were total losses.

In July 1968, the House Armed Services Committee and the Senate disapproved a Department of Defense request for further development of the F-111B. It is interesting to note that in the very same month Congress authorized the development of Grumman's F-14, a program which some people claim could have started six years earlier if Grumman had not been saddled with the F-111B.

A month later, in August 1968, the F-111B program was cancelled outright.

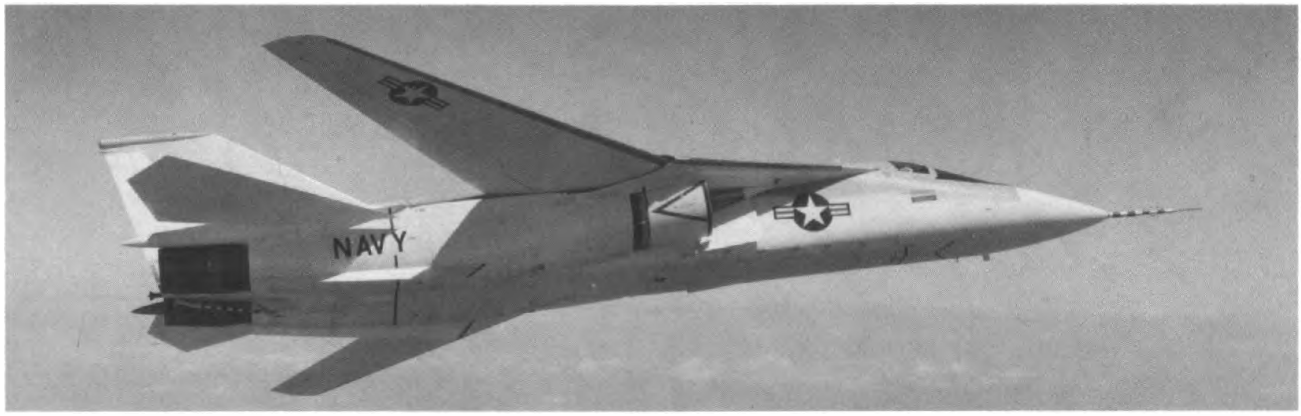


Another shot of the first YF-111B. Note the arresting hook located between the engines. *(Grumman)*

Refueling an F-111B during carrier qualifications. *(Grumman)*

Workmen around the nose gear of an F-111B. Note the electrical connection. One man has his arm on the catapult launch arm, and the box just above the arm houses three approach indicator lights. *(Grumman)*

F-111B making an approach during carrier qualifications. *(Grumman)*



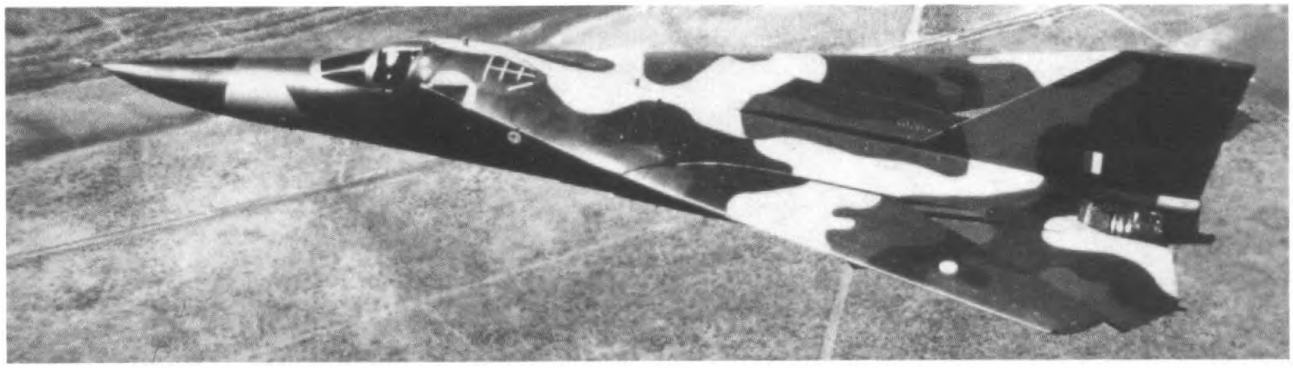
Underside view of the number two YF-111B with the wings in the middle position. Note the position of the intake and blow-in doors. *(Grumman)*

Second YF-111B in flight. Note the differences in the camouflage scheme when compared to the first YF-111B shown on page 20. *(Grumman)*

Fifth and last YF-111B, 151974, shown with the wings in the full aft position. *(Grumman)*

The fourth YF-111B, armed with dummy Phoenix missiles, poses with an earlier Grumman product, an FF-1. *(Grumman)*

F-111C



F-111C in flight with its wings fully swept. *(General Dynamics)*

As mentioned earlier, the F-111C is an F-111A built for the Royal Australian Air Force. Differences from the U.S. F-111A are the longer wings, as used on the F-111B and FB-111A, and a removable right control stick. The F-111C also has the larger and stronger landing gear, brakes, and tires of the FB-111A. Otherwise, even the paint scheme is the same as the F-111A.

In 1963, the Australians were looking for a replacement for their aging Canberras. Consideration was given to the British TSR.2, the American A-5 Vigilante and F-4 Phantom, and the Mirage IVA bomber from France.

But in October the Australians changed their minds, and placed an order for 24 F-111s. They would be delivered during late 1968. However, when the U.S. started having trouble with its F-111, to include cracks in the wing carry-through box, Australia expressed concern over its purchase of the F-111.

The first F-111C made its first flight in July 1968, and it was quickly followed by the other 23 aircraft. In September the Australian government accepted its first F-111C. Then all 24 aircraft were put in storage where they were to be left until the problems with the American aircraft were corrected.

Finally, in December 1969, Australia sent flight crews to the United States to pick up the F-111Cs and fly them to Australia. But before they could get the aircraft, an F-111A at Nellis shed one of its wings and crashed. This caused the F-111Cs to be disassembled again and be put back in storage, and it seemed that the Australians might cancel the entire F-111C order.

While waiting for the final disposition on the F-111C, the Australians were provided with F-4Es under a lease agreement. These became very popular with the RAAF, and some people wanted to keep them and forget about the F-111. But finally, on June 1, 1973, the first F-111Cs arrived in Australia after receiving new wing boxes and many other modifications. They were assigned to numbers 1 and 6 squadrons of 82 Wing where they have served admirably ever since.

Although England had once ordered the F-111K, they cancelled the order before the delivery of any aircraft. Therefore, it now appears certain that the Australians will be the first, last, and only foreign power to fly the F-111. Dispite the early problems and lengthy delays, the RAAF seems happy with the F-111C which is their most potent aircraft.

Reconnaissance equipment installed in the weapons bay of an F-111C *(General Dynamics)*

F-111D

F-111D, 68-097, of the 522nd TFS, 27th TFW, takes off from Cannon Air Force Base loaded with twelve 500 pound bombs. ***(Rotramel)***

The F-111D followed the F-111E into operational service with the U.S. Air Force's tactical fighter squadrons. It featured an advanced Mark II avionics systems, an environmental control system, and a more powerful P-9 engine. As originally planned, it was also to carry the AIM-7G-1 Sparrow air-to-air missile in addition to an improved version of the AIM-9 Sidewinder.

In 1969 the increases in cost of the Mark II system caused cuts in the F-111D program, and only enough aircraft were authorized to equip one wing. Only 96 aircraft were to be built as compared to 315 once slated for production. Sixty RF-111Ds, originally planned for, were cancelled in September 1969 in favor of a less expensive RF-111A, but that too was cancelled. F-111Ds under procurement beyond the 96 purchased were to receive less expensive avionics and be designated F-111Fs.

Other changes in the F-111D included the use of the larger tires and parts of the FB-111A's stronger landing gear. This permitted the F-111D to operate at heavier gross weights.

The first flight of a production F-111D was made on May 15, 1970 by F-111D, 68-085. Acceptance by the Air Force was on June 30, 1970, and even though this first aircraft had the new P-9 engines, it lacked the full Mark II avionics system.

Flight testing was conducted with more emphasis given to the testing of the new avionics system rather than the airframe. The airframe was essentially the same as that of the F-111E, to include the Triple Plow II intake. The testing was delayed considerably due to the lack of availability of a Mark II system. Escalating costs of the Mark II system, and not the aircraft itself, was what caused the reduction in the number of F-111Ds that were to be purchased. During testing there were several problems with the Mark II, and in particular, Norden's Integrated Display Set required extensive changes.

When the problems were corrected, the F-111D entered operational service with the 27th TFW at Cannon AFB, New Mexico on November 1, 1971. Initial operational capability with a full squadron did not occur until September 1972. Even then, there were many operational problems encountered which centered on the avionics system. The biggest problem was the lack of spares, and the F-111D could not look for spares from other F-111s because no other F-111 had the same avionics system.

In many respects, commonality was a thing of the past, even among the Air Force versions of the F-111s. Avionics problems, combined with a defect in the environmental system, caused the F-111D abort rate to be higher than that of other F-111s during 1973. However, with problems finally worked out, the 27th TFW achieved full readiness, and remains the only wing to operate the F-111D.

F-111D TECHNICAL DATA

Development

The F-111D is similar to the F-111A except for the Mark II avionics, the TF30-P-9 engines, redesigned air induction system and the bootstrap-cycle environmental control system.

Date of Contract	Jun 66
First Flight (Prototype)	Nov 68
First Acceptance (Production)	Jun 70
First Service Use	Dec 70
Production Completed	Feb 73
Total Production Aircraft Contracted For	96

POWER PLANT

No. & Model	(2) TF30-P-9
Mfr	Pratt & Whitney
Engine Spec No.	A-6123A
Type	Twin Spool, Turbofan
Length	241.6 in
Diameter (compressor face)	38.12 in
Weight (dry)	4070 lb
Nozzle	Variable Area, Blow-in Door Ejector
Augmentation	Afterburning

FUEL

Location	No. Tanks	Gal
Wg, int	2	778
Fus, fwd	1	2808
Fus, aft	1	1429
Fuel lines	-	28
Wg, ext, drop	*4	2400
	Total	7443

* Combinations of loading modes allow only 4 of 6 tanks to be carried.

Grade	JP-4
Specification	MIL-T-5624

OIL

Engine	4 gal/eng (tot) 8
Specification	MIL-L-7808

WEIGHTS

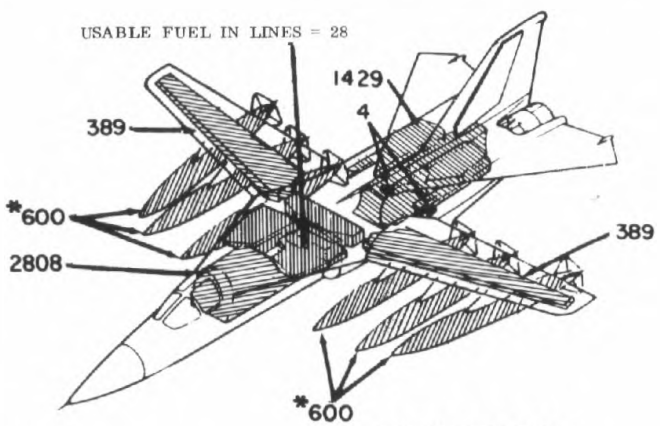
Loading	Lb	L.F.
Empty	46,631(A)	
Basic	50,294(A)	
Design	73,000	7.0
Combat	*61,930	
Max T.O. (overload)	†100,000	4.6(E)
Max T.O. (normal)	†100,000	4.6(E)
Max Land	‡ 72,000	

(A) Actual
(E) Estimated
* For Basic Mission
† Limited by gear strength
‡ 8 ft/sec rate of sink

ENGINE RATINGS

S.L. Static	LB	-	RPM	-	MIN
Max:	*20,840	-	14,660	-	45
Intermed:	12,430	-	14,740	-	45
Max Cont:	10,600	-	14,170	-	Cont

* With afterburner operating

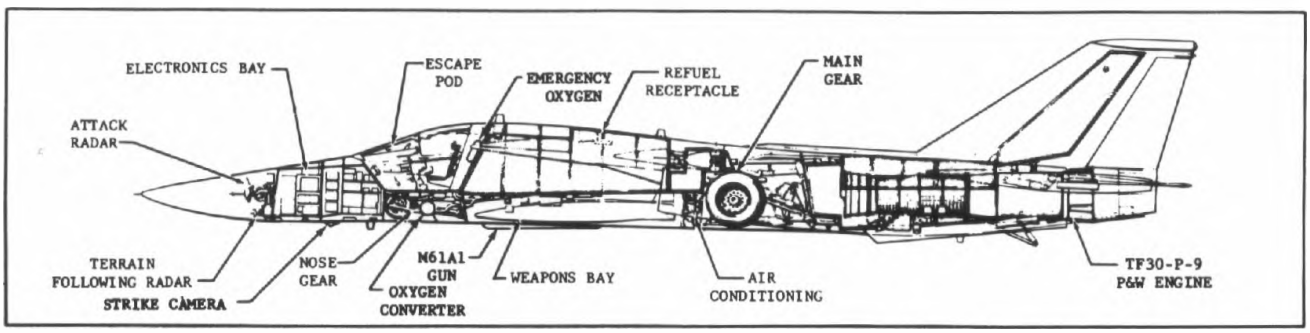


*Combination of loading modes allow only 4 of 6 tanks to be carried. The 2 outboard tanks are not authorized in combination with inboard tanks.

Fuel (Gal) Oil (Gal)

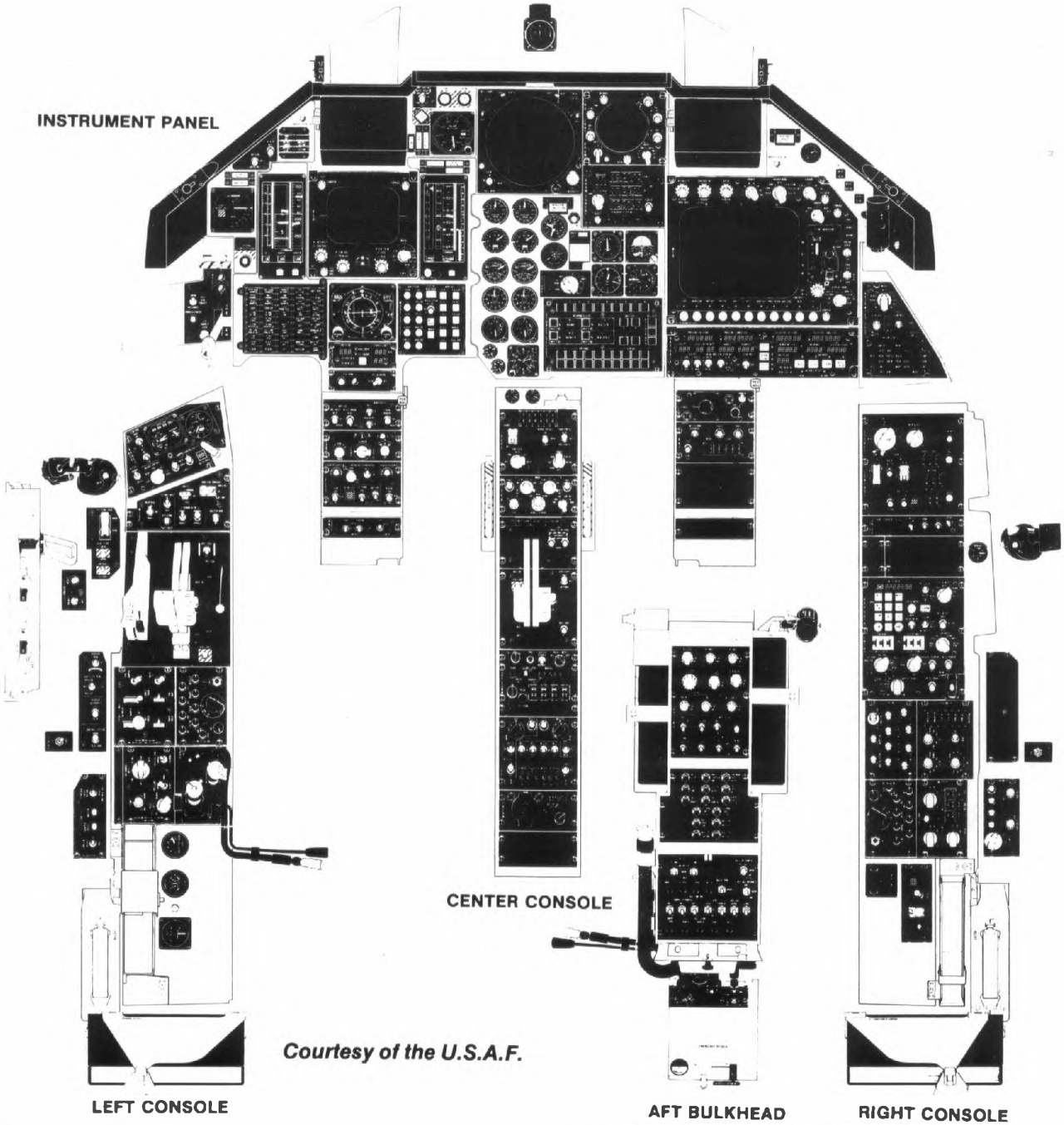
ELECTRONICS

Mission & Traffic Control	
UHF Command Radio	AN/ARC-109
HF Radio	AN/ARC-123
Interphone	AN/AIC-25
IFF (AIMS)	AN/APX-64(V)
IFF	AN/APX-76
ILS	AN/ARN-58A
TACAN	AN/ARN-52(V)
UHF DF	AN/ARA-50
Penetration Aids	
ECM	AN/ALQ-94
IR Receiving Set	AN/AAR-34
RHAWS	AN/APS-109C
CMRS	AN/ALR-41
CMDS	AN/ALE-28
ECM Pods (2)	AN/ALQ-87
ECM Pods (2)	AN/ALQ-101
Fire Power Control	
Inertial Bomb Nav Sys	AN/AJN-16
GD Digital Computer	AN/AYK-6
HSD	AN/AYN-3
Integrated Display	AN/AVA-9
Attack Radar	AN/APQ-130
Radar Altimeter	AN/APN-167
Terrain Following Radar	AN/APQ-128
Doppler Radar	AN/APN-189
Photographic Equipment	
Strike Camera	KB-18A

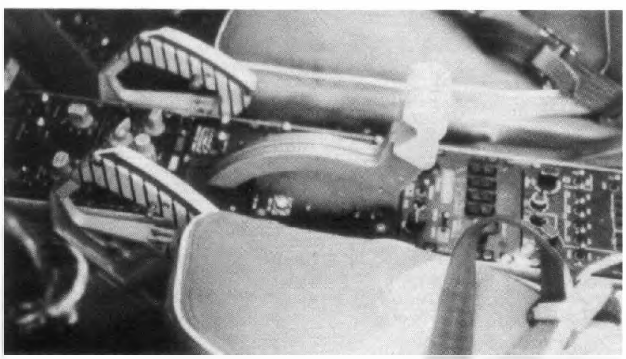


Courtesy of the U.S.A.F.

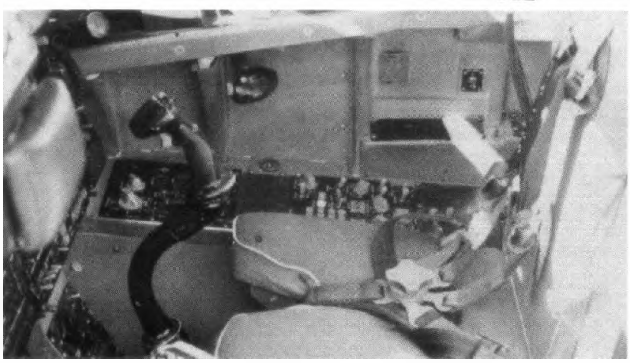
F-111D COCKPIT



Courtesy of the U.S.A.F.

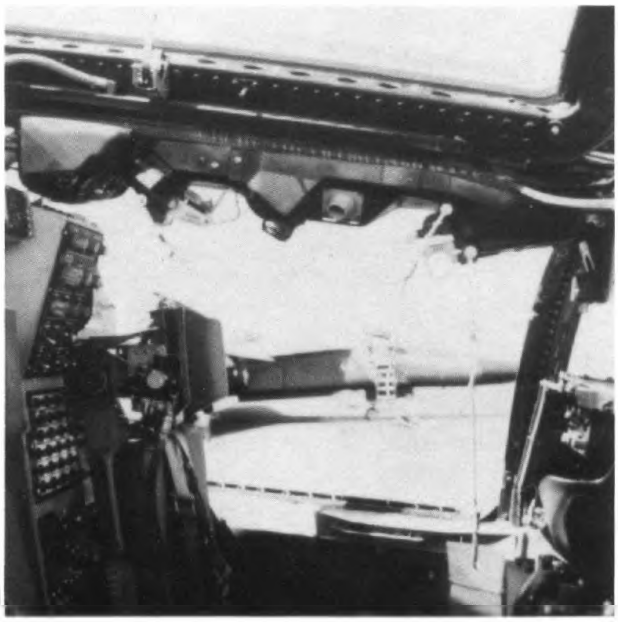


Center console details showing throttles.
(Jackson)



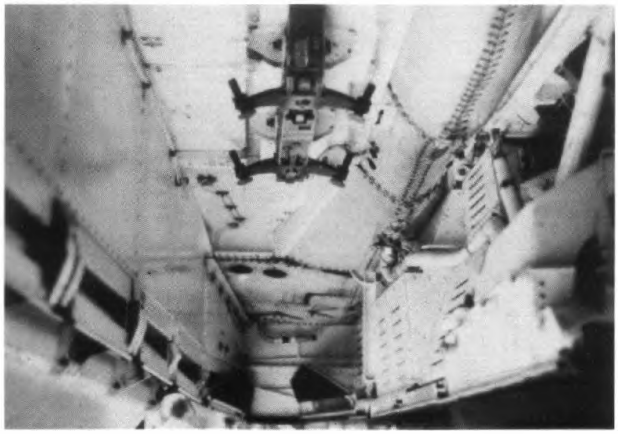
Right console and sidewall detail in an F-111D.
(Jackson)

F-111D DETAILS

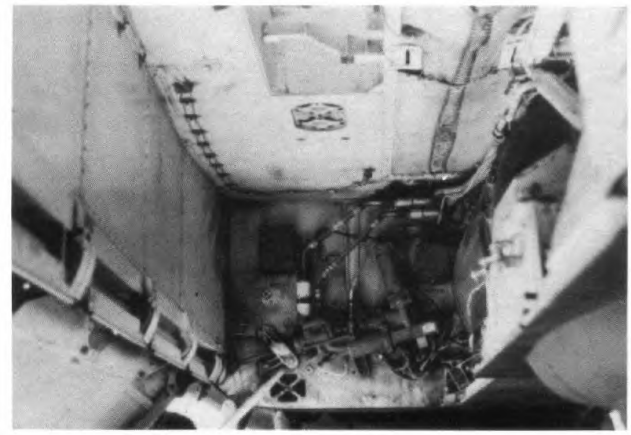


Canopy center beam assembly. *(Miklasevich)*

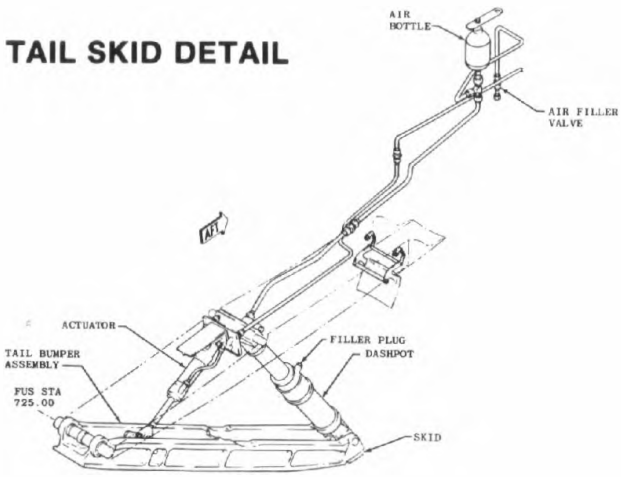
Aft bulkhead located between the seats. *(Jackson)*

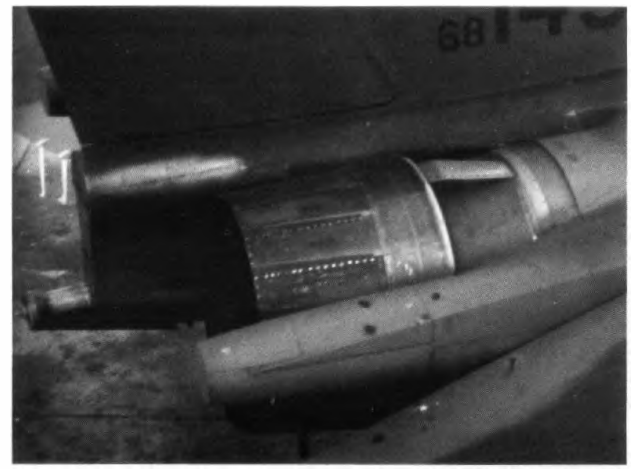


Weapons bay looking forward. *(Jackson)*



Weapons bay looking aft. *(Jackson)*





Right side engine installation. The blunt fairing just outboard of the engine houses electronics antennas. *(Rotramel)*

F-111F

F-111F, 72-1446, from the 389th TFS, 366th TFW, Mountain Home AFB, 19 October 1973. (Rotramel)

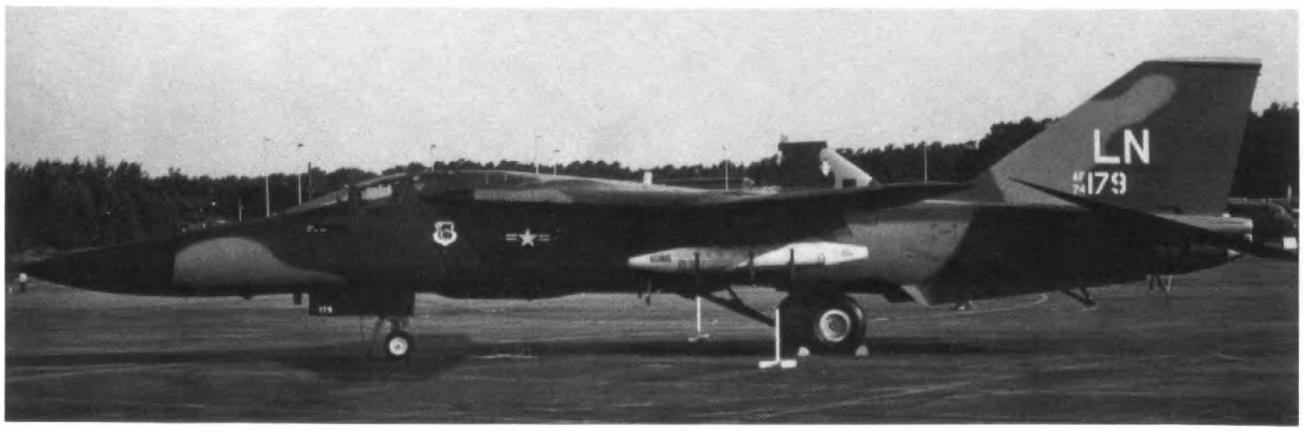
The final F-111 delivered to TAC was the F-111F. It was to be the "hottest" F-111 produced due to the incorporation of the TF30-P-100 engine. This new version of the engine provided better than 4,000 pounds more thrust than the P-9 used in the F-111D. Other new features of the F-111F were the less expensive avionics system, an improved landing gear, and a "Safe Life" wing carry-through box. The cheaper avionics package, chosen due to the rising cost of the Mark II system in the F-111D, incorporated features of both the F-111D and the FB-111A. Other less costly components from earlier F-111s were also used, such as the F-111E's stores management set. The avionics system as installed in the F-111F was designated "Mark 11B," but should not be confused with the Mark II system of the F-111D.

Originally the Air Force expected 219 F-111Fs, but this number was cut to 82 in June 1970. Then, in March 1971, 12 aircraft were added bringing the total to 94. Another 12 were added in July 1972, bringing the final total to 106, but, like the F-111D, this was enough to equip only one wing.

Early problems with the P-100 engine delayed its availability, and the first 49 -Fs were fitted with the P-9 engine. However, once the P-100 became available, it was retrofitted to these aircraft.

The F-111F entered operational service with the 347th TFW at Mountain Home AFB, Idaho on September 20, 1971. It was only a few months later, in January 1972, that the first of the 347th TFW's squadrons became operationally ready. This was followed by the entire wing becoming operational by October of the same year. Since then the F-111Fs have been transferred to the 48th TFW at Lakenheath, England. Today the F-111A and EF-111A are the only F-111s stationed at Mountain Home.

Although the F-111F experienced some early engine problems in the cold weather of Idaho, modifications were made that raised the operational life of the engine from 450 to 600 hours. Pratt & Whitney later indicated that the time between overhauls could be raised to about 2000 hours by reducing the maximum thrust to 23,000 pounds. Other than these engine problems, the F-111F experienced fewer supply problems than the F-111D, and had a higher operational rate than even the F-111A. The last F-111F built was also the last of any F-111s built, and will probably remain so unless the FB-111H bomber receives a presently unexpected new lease on life.



F-111F, 74-179, of the 48th TFW, Lakenheath, England. The 48th TFW is now the only wing operating the F-111F. (via Leader)

F-111F TECHNICAL DATA

Development

The F-111F is similar to the F-111D except for the Mark IIB avionics and the TF30-P-100 engines.

Date of Contract	Sep 69
First Flight (Prototype)	Aug 71
First Acceptance (Production)	Sep 71
First Service Use	Oct 71
Production Completed	Jul 76
Total Production Aircraft Contracted For	106

POWER PLANT

No. & Model	(2) TF30-P-100
Mfr	Pratt & Whitney
Engine Spec No.	A-6124A
Type	Twin Spool, Turbofan
Length	241.7 in
Diameter (compressor face)	38.12 in
Weight (dry)	3985 lb
Nozzle	Variable Area, Blow-in Door Ejector
Augmentation	Afterburning

FUEL

Location	No. Tanks	Gal
Wg, int	2	778
Fus, fwd	1	2800
Fus, aft	1	1429
Fuel lines	–	28
Wg, ext, drop	*4	2400
	Total	7435

* Combinations of loading modes allow only 4 of 6 tanks to be carried.

Grade	JP-4
Specification	MIL-T-5624

OIL

Engine	4 gal/eng (tot) 8
Specification	MIL-L-7808

WEIGHTS

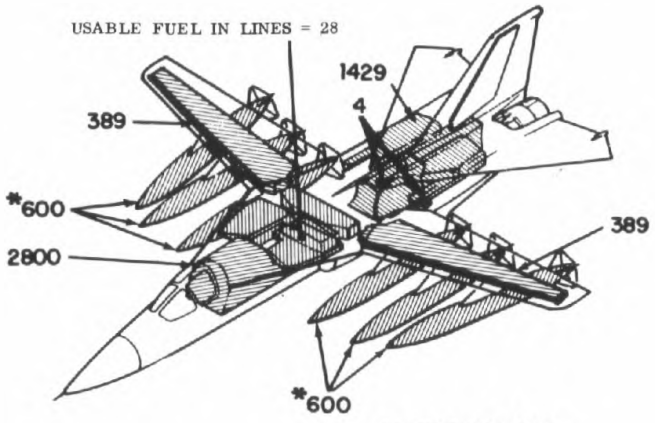
Loading	Lb	L.F.
Empty	47,481(C)	
Basic	51,190(C)	
Design	73,000	7.33
Combat	*62,350	
Max T.O. (overload)	†100,000	4.6(E)
Max T.O. (normal)	†100,000	4.6(E)
Max Land	‡ 72,000	

(C) Calculated
(E) Estimated
* For Basic Mission
† Limited by gear strength
‡ 8 ft/sec rate of sink

ENGINE RATINGS

S.L. Static	LB	–	RPM	– MIN
Max:	*26,100	–	14,770	– 45
Intermed·	14,560	–	14,870	– 45
Max Cont:	13,170	–	14,430	– Cont

* With afterburner operating

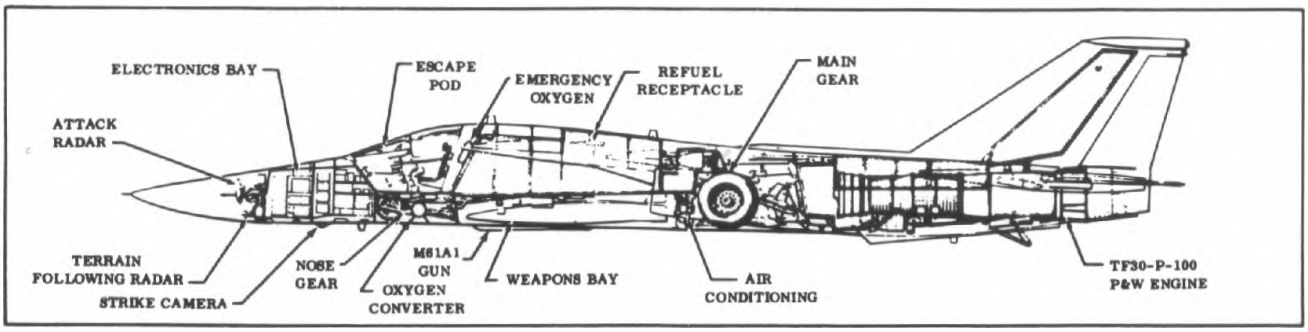


*Combination of loading modes allow only 4 of 6 tanks to be carried. The 2 outboard tanks are not authorized in combination with inboard tanks.

Fuel (Gal) Oil (Gal)

ELECTRONICS

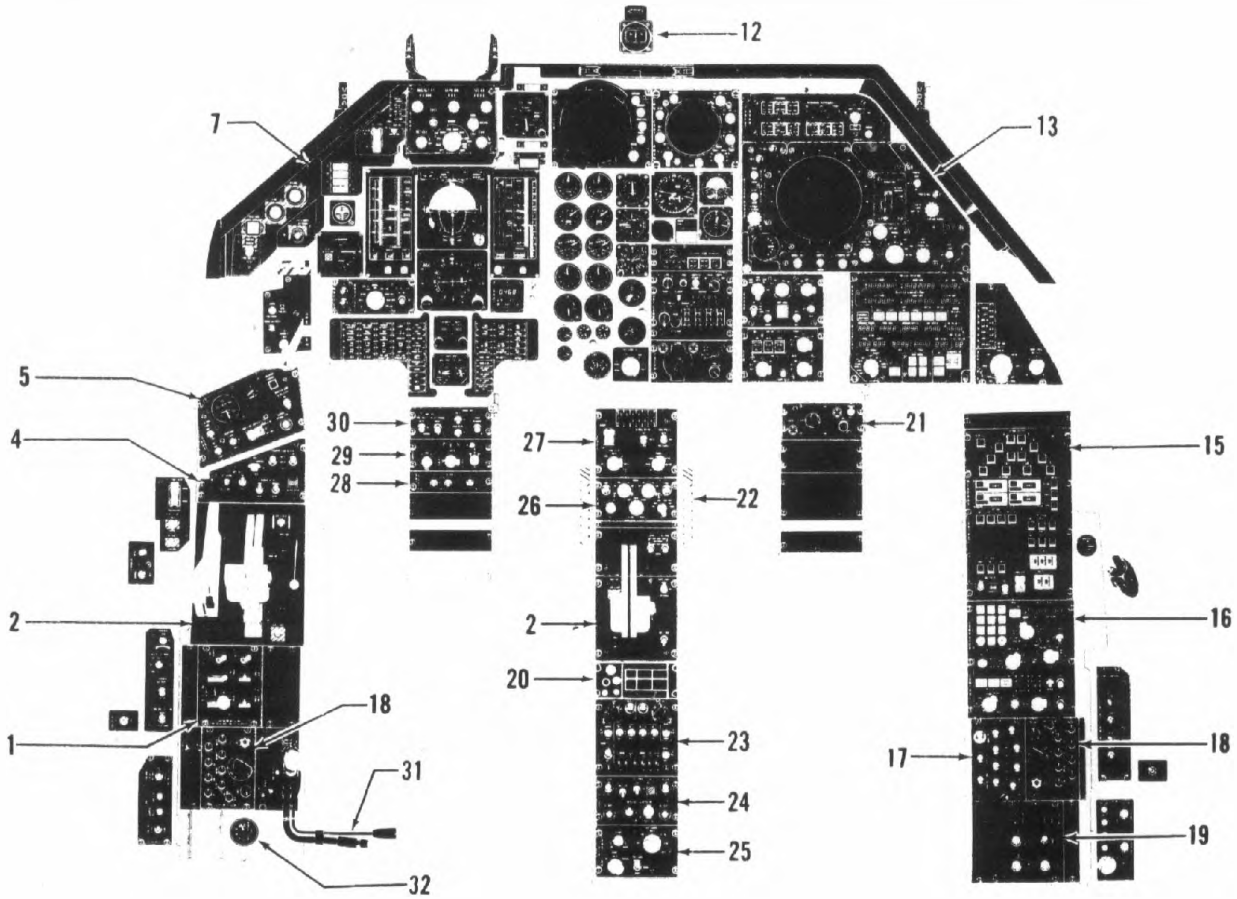
Mission & Traffic Control	
UHF Command Radio	AN/ARC-109
HF Radio	AN/ARC-123
Interphone	AN/AIC-25
IFF (AIMS)	AN/APX-64(V)
ILS	AN/ARN-58A
TACAN	AN/ARN-52(V)
UHF DF	AN/ARA-50
Penetration Aids	
ECM	AN/ALQ-94
IR Receiving Set	AN/AAR-34
RWR	AN/APS-109
CMRS	AN/ALR-41
CMDS	AN/ALE-28
ECM Pods (2)	AN/ALQ-87
ECM Pods (2)	AN/ALQ-101
Fire Power Control	
Inertial Bomb Nav Sys	AN/AJN-16
GD Digital Computer	AN/AYK-6
Optical Display Sight	AN/ASG-27
Attack Radar	AN/APQ-144
Radar Altimeter	AN/APN-167
Terrain Following Radar	AN/APQ-146
Photographic Equipment	
Strike Camera	KB-18A

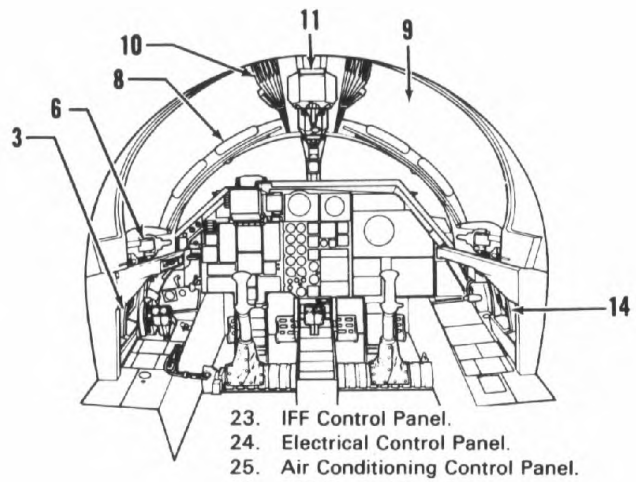


Courtesy of the U.S.A.F.

F-111F COCKPIT

Crew Station General Arrangement (Typical)



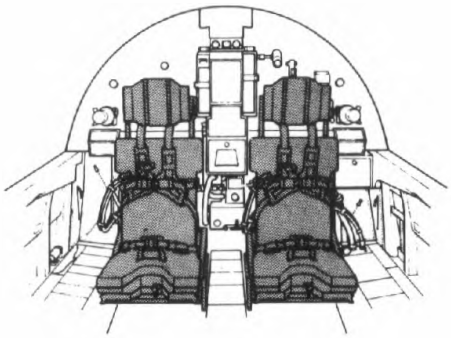


1. Autopilot/Damper Panel.
2. Throttle Panel.
3. Left Sidewall.
4. Miscellaneous Switch Panel.
5. Auxiliary Gage Panel.
6. Internal Canopy Latch Handles (2).
7. Left Main Instrument Panel.
8. Mirrors (4).
9. Canopy.
10. Thermal Curtain (2).
11. Canopy Center Beam Assembly.
12. Magnetic Compass.
13. Right Main Instrument Panel.
14. Right Sidewall.
15. Weapons Control Panel.
16. Computer Control Panel.
17. HF Radio Control Panel.
18. Interphone Control Panel (2).
19. CMDS Control Panel.
20. ECM Pod Control Panel.
21. ILS Control Panel.
22. Ejection Handles (2).
23. IFF Control Panel.
24. Electrical Control Panel.
25. Air Conditioning Control Panel.
26. TFR Control Panel.
27. Fuel Control Panel.
28. Antenna Select Panel.
29. Compass Control Panel.
30. Windshield/Anti-Icing Control Panel.
31. Left Station Oxygen-Suit Control Panel.
32. Oxygen Gage.

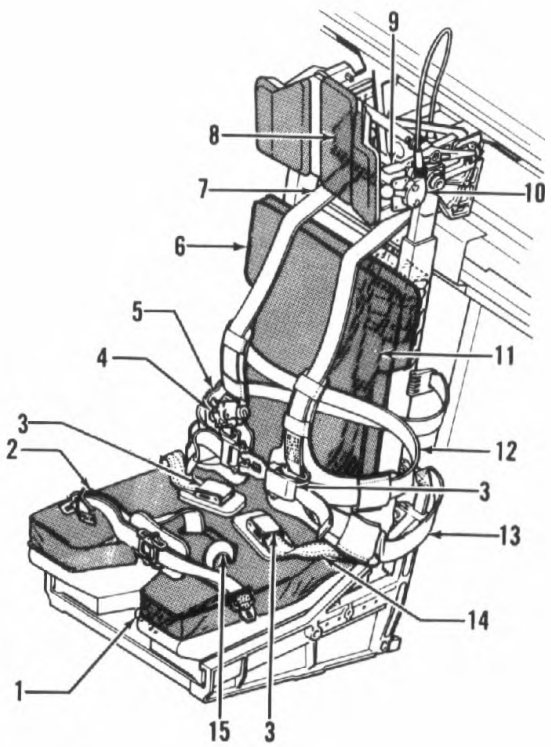
Courtesy of the U.S.A.F.

F-111F, 71-891, of the 48th TFW, Lakenheath, England with black codes. This aircraft is named, "East Anglia." (Rotramel)

Crew Module Seats

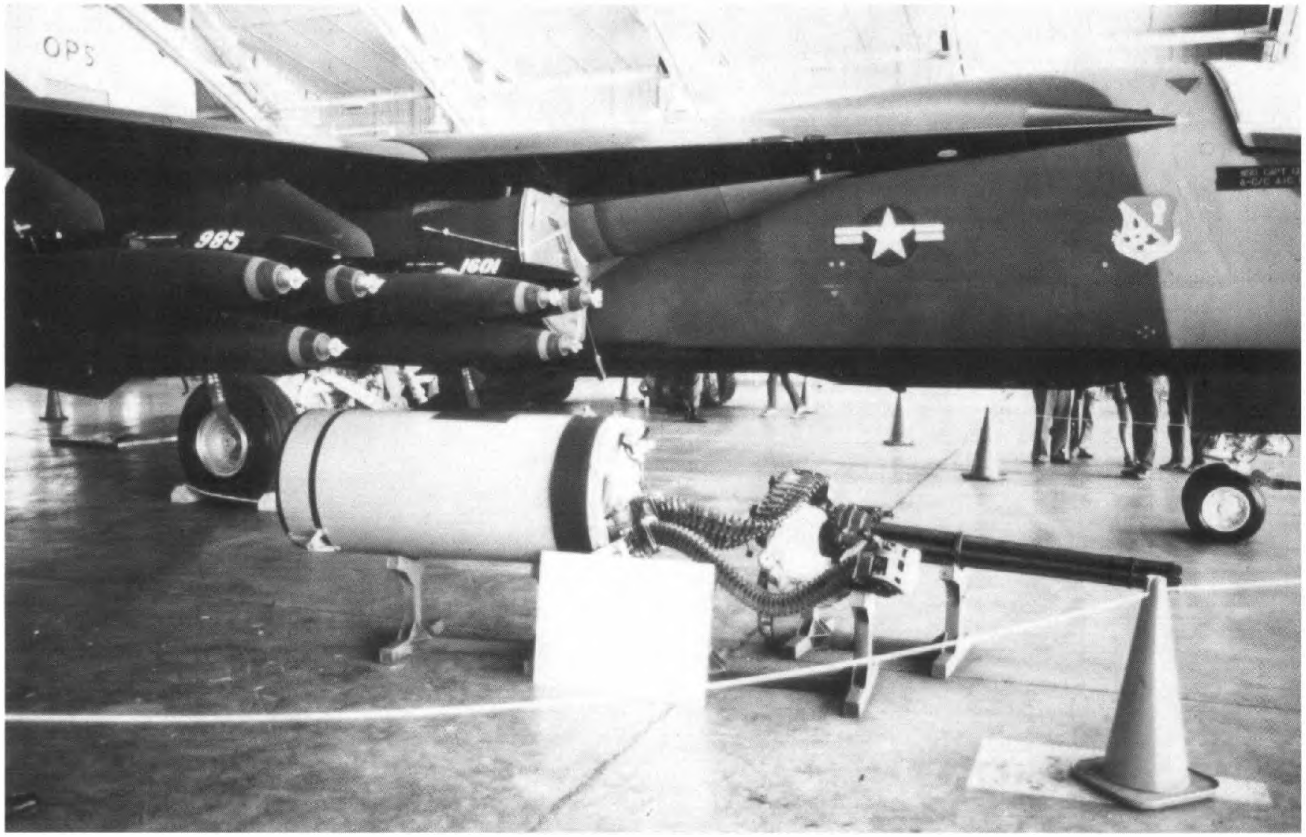


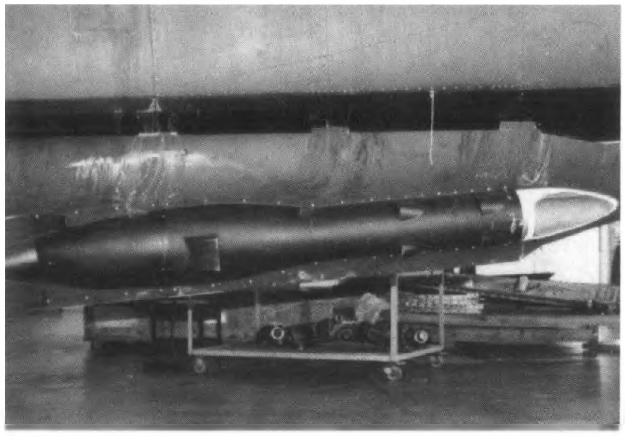
1. Seat Fore and Aft Adjustment Lever.
2. Lower Torso Restraint Harness.
3. Quick Release Buckle (3).
4. Oxygen Regulator
5. Upper Torso Restraint Harness.
6. Seat Back Cushion.
7. Shoulder Strap.
8. Inertia Reel.
9. Headrest Adjustment Lever (2).
10. Inertia Reel Control Handle.
11. Seat Adjustment Actuator.
12. Chest Strap.
13. Trunk Strap.
14. Lap Belt.
15. Crotch Straps.



Courtesy of the U.S.A.F.

20 MM CANNON DETAILS



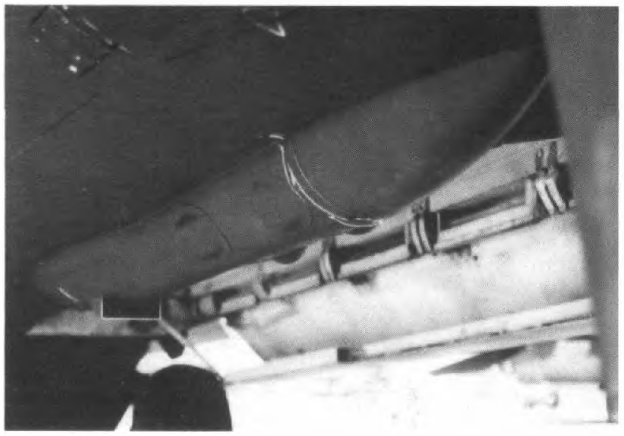


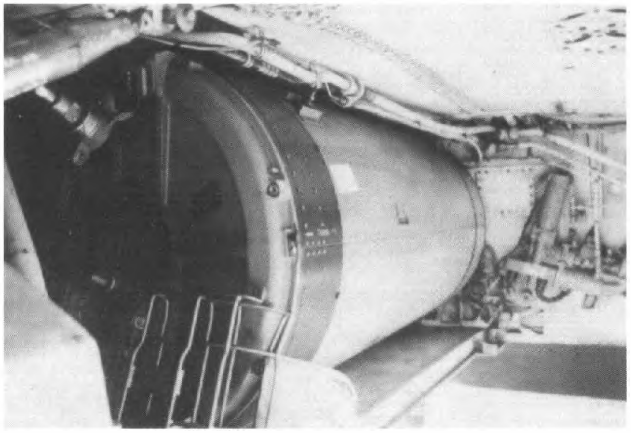
Above: Cannon and ammunition drum assembly removed from an F-111. (Jackson)

Left: Cannon fairing on open right weapons bay door. (Rotramel)

Below left: Cannon fairing on closed weapons bay door with muzzle covered. (Rotramel)

Below right: Ammunition drum installed in the weapons bay. (Jackson)





F-111 COLORS - A THRU F

The second RDT&E prototype F-111A in flight wearing its unusual bare metal finish. The fourth prototype also carried a bare metal finish.
(General Dynamics)

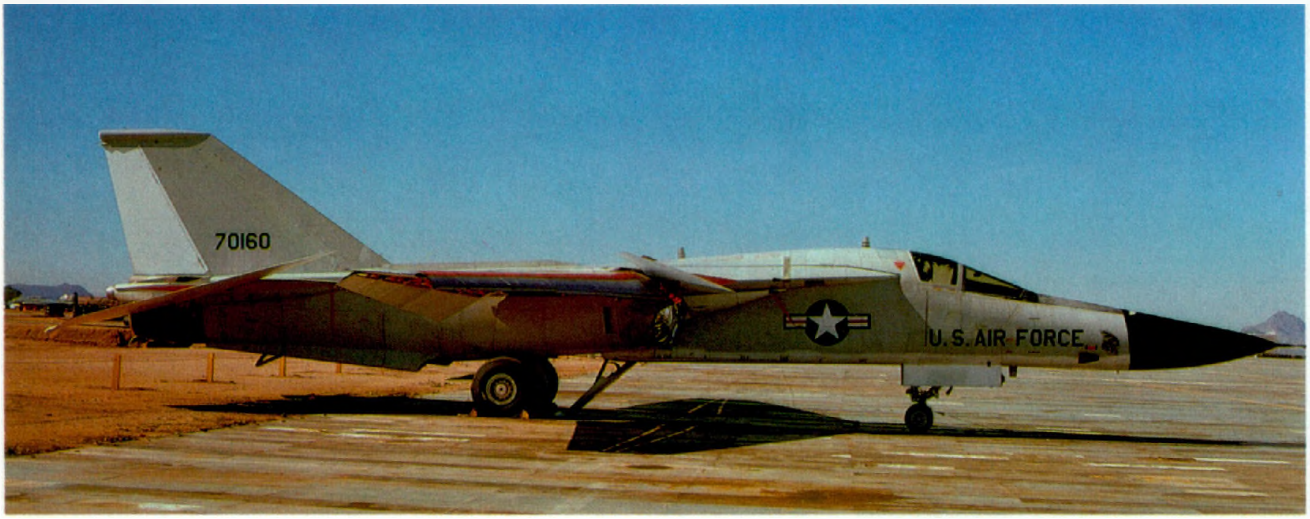
F-111B in flight with Phoenix missiles under the wings. *(U.S. Navy)*

Australian F-111C *(General Dynamics)*

F-111D, 68-104, wing commander's aircraft, 27th TFW. *(Leader)*

F-111E, 67-0120 from the 422nd FWS, 57th FWW, Nellis AFB, August 1971. *(Malerba)*

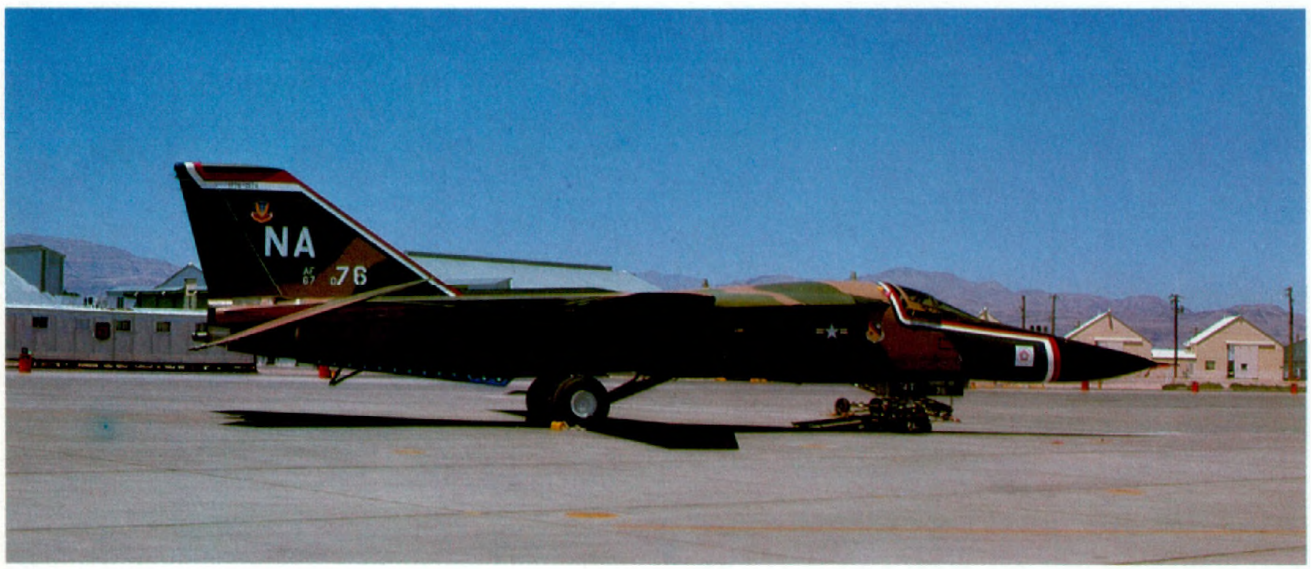
F-111F, 71-889, of the 48th TFW, Lakenheath, England, August 1981. *(Rotramel)*



FB-111A, 67-0160, in the original light gull gray and white paint scheme, December 27, 1974.
(Knowles via Leader)

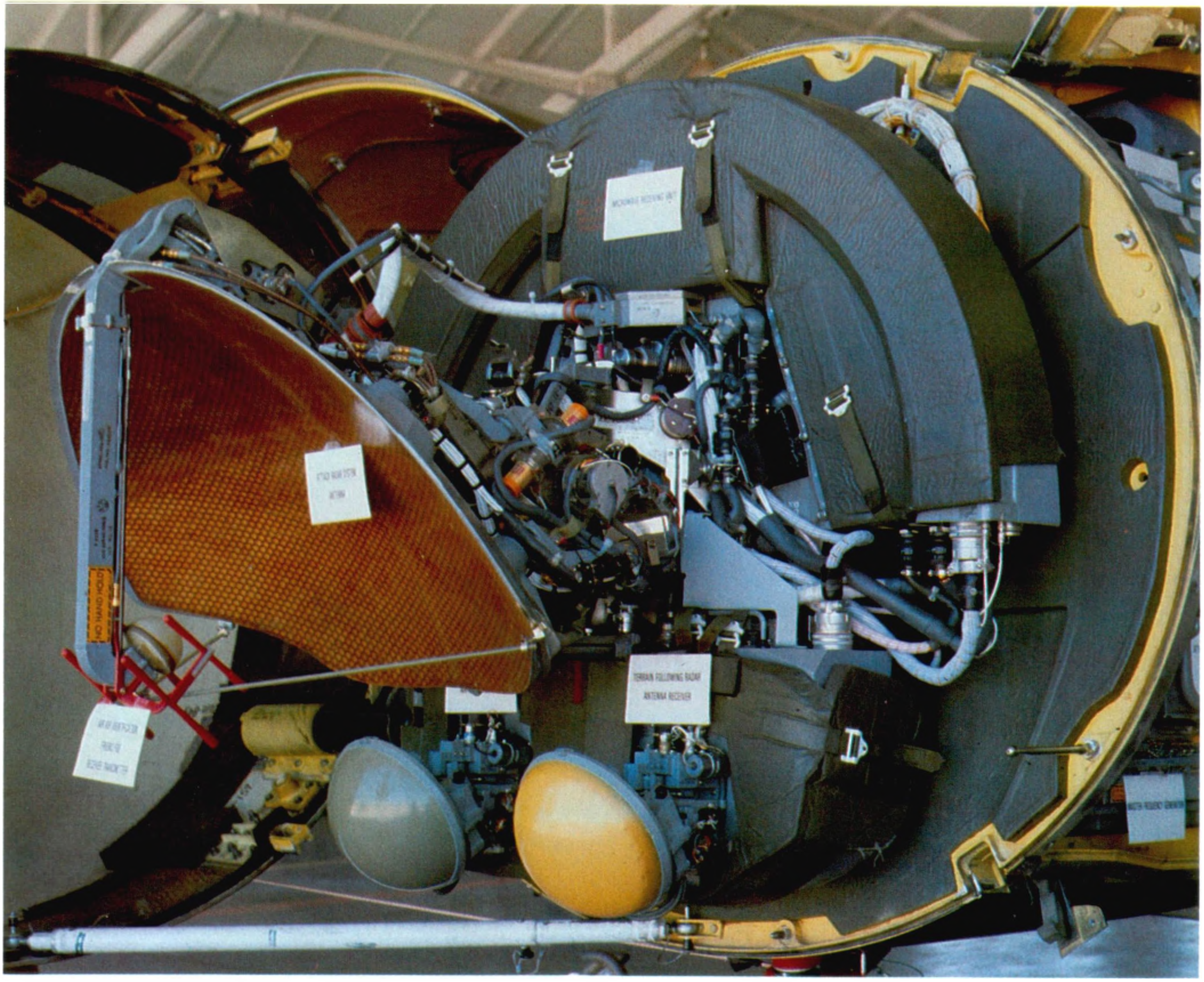
F-111A used by NASA as a test aircraft for a super-critical wing. TACT stands for Transonic AirCraft Technology. *(Sherlock)*

Another photo of the TACT aircraft. Note the negative incidence to the wing tip.
(Bergagnini via Leader)

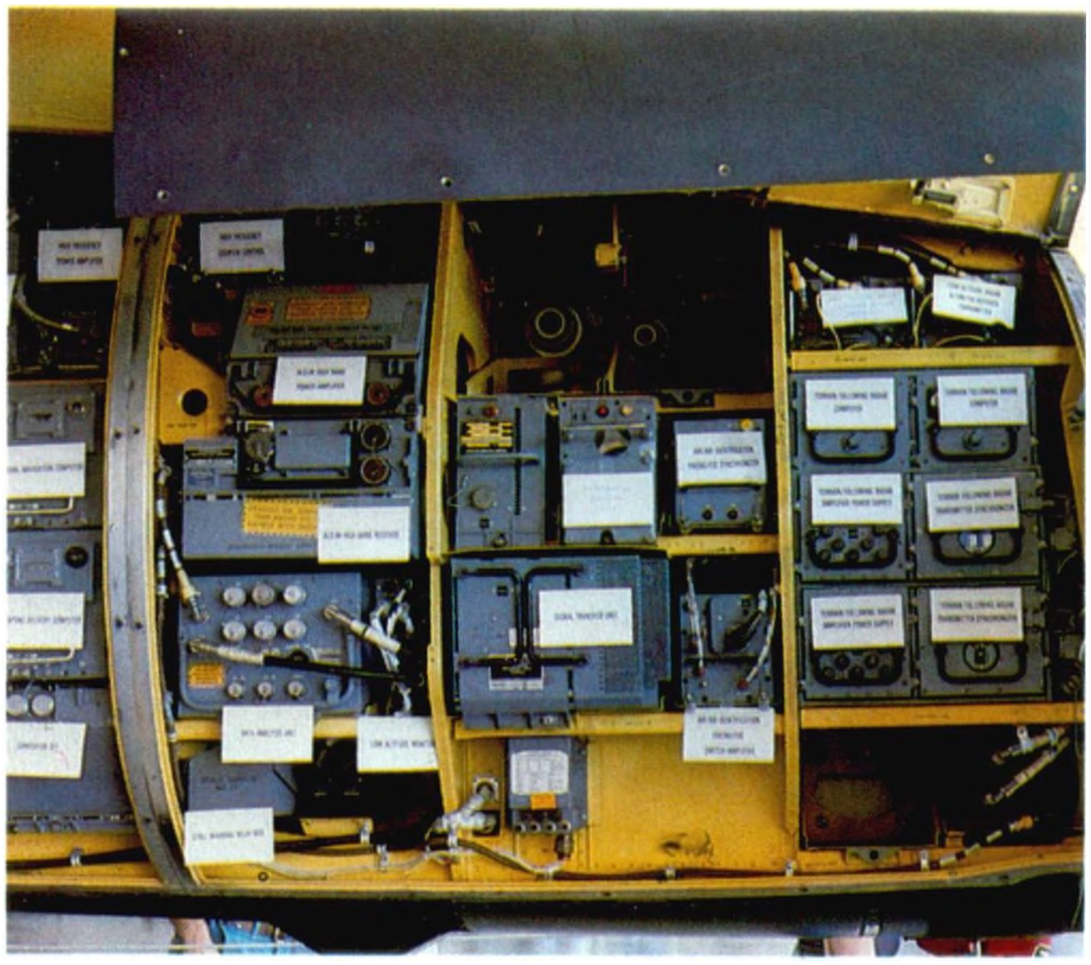


F-111A, 67-0076, of the 474th TFW in June 1976 sporting bi-centennial markings. *(Logan via Leader)*

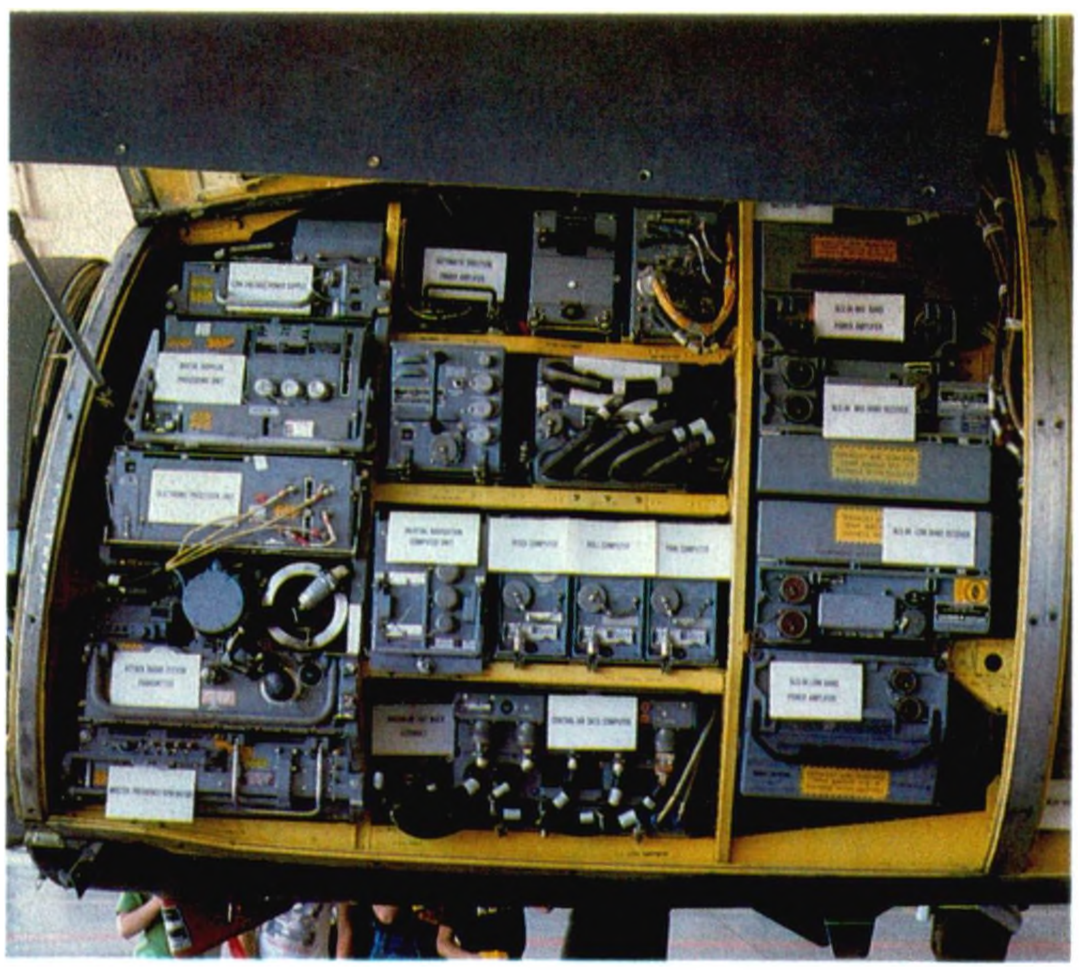
AVIONICS



Radar installation on an F-111D. *(Jackson)*



F-111D avionics, right side. *(Jackson)*



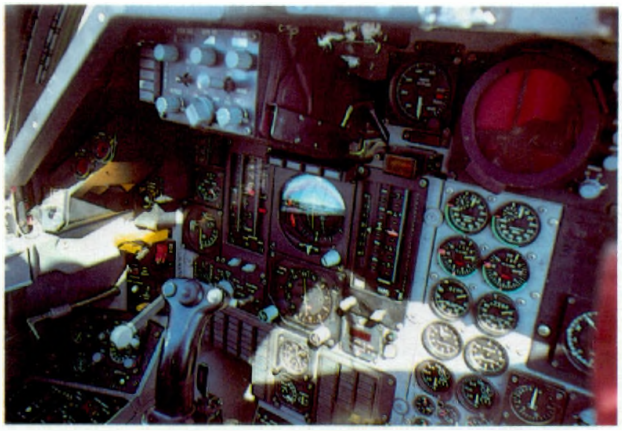
F-111D avionics, left side. *(Jackson)*

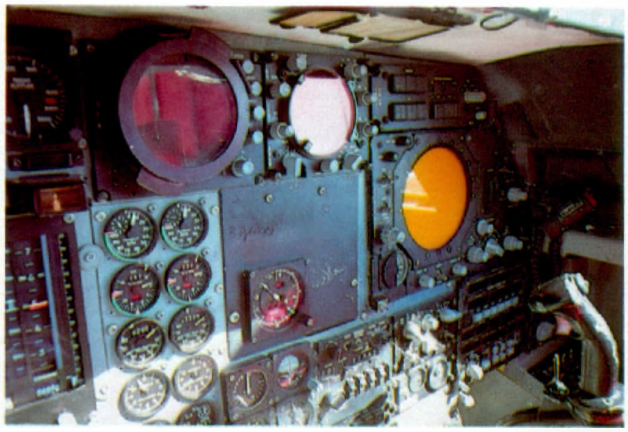
FB-111A

FB-111A in the original light gull gray and white scheme with a SAC band on the fuselage. Four SRAMs are being carried under the wings. *(General Dynamics)*

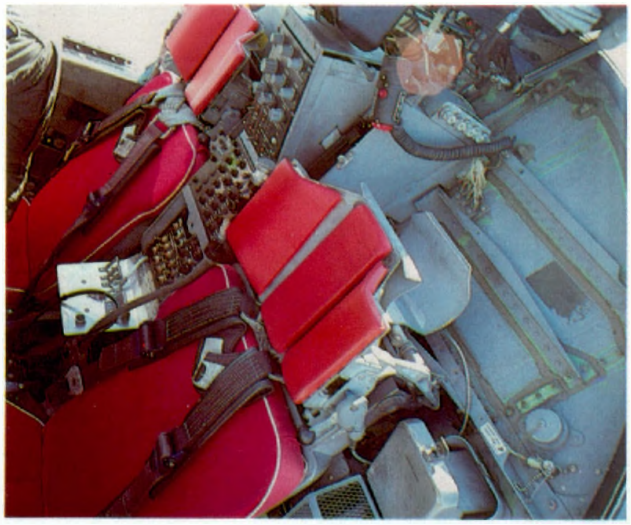
FB-111A in the camouflage scheme it carries today. The colors and pattern is different from that used on other F-111s. *(General Dynamics)*

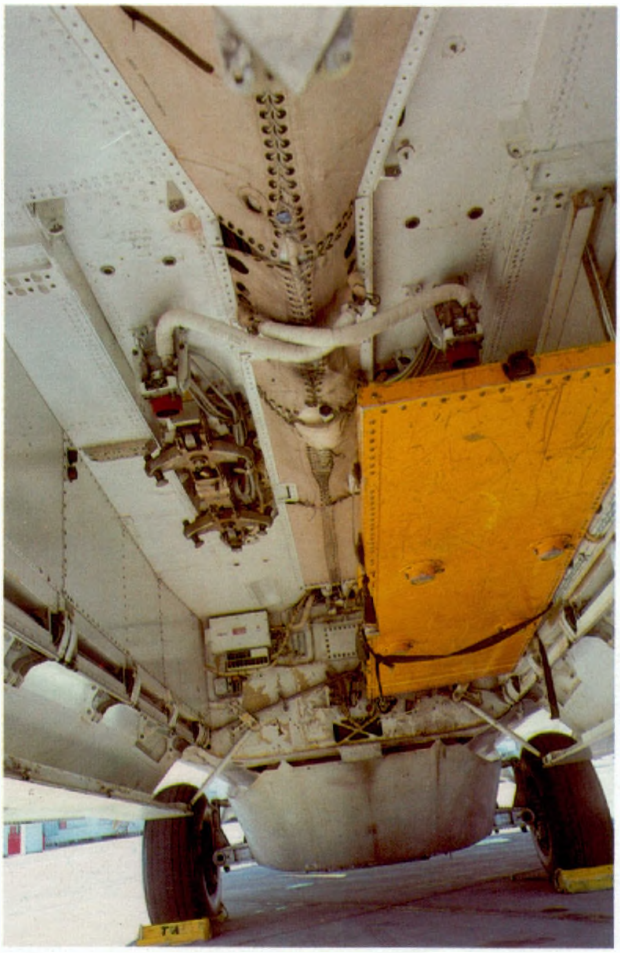
FB-111A DETAILS

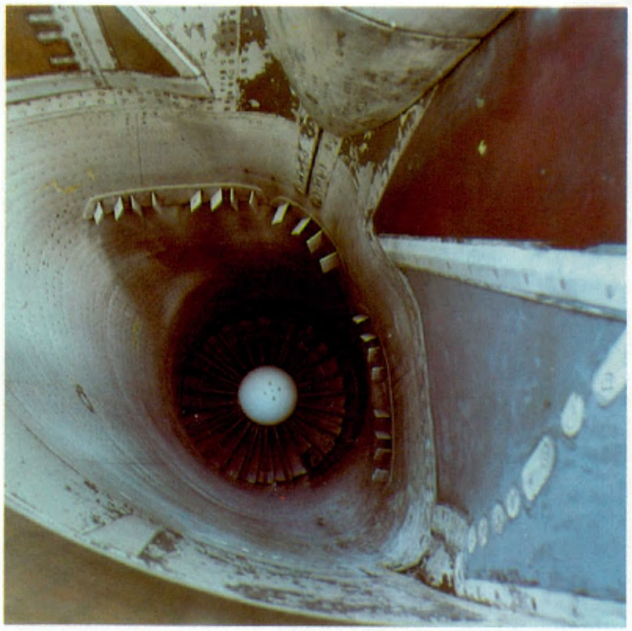




Above: Pilot's instrument panel.
Above right: WSO's instrument panel.
Right: Seats and aft bulkhead.
Below: Bomb bay looking aft.
Below right: Interior of right intake.







The first prototype F-111A, 63-9766, in flight. *(General Dynamics)*

Wing commander's aircraft from the 20th TFW, March 9, 1977. *(via Leader)*

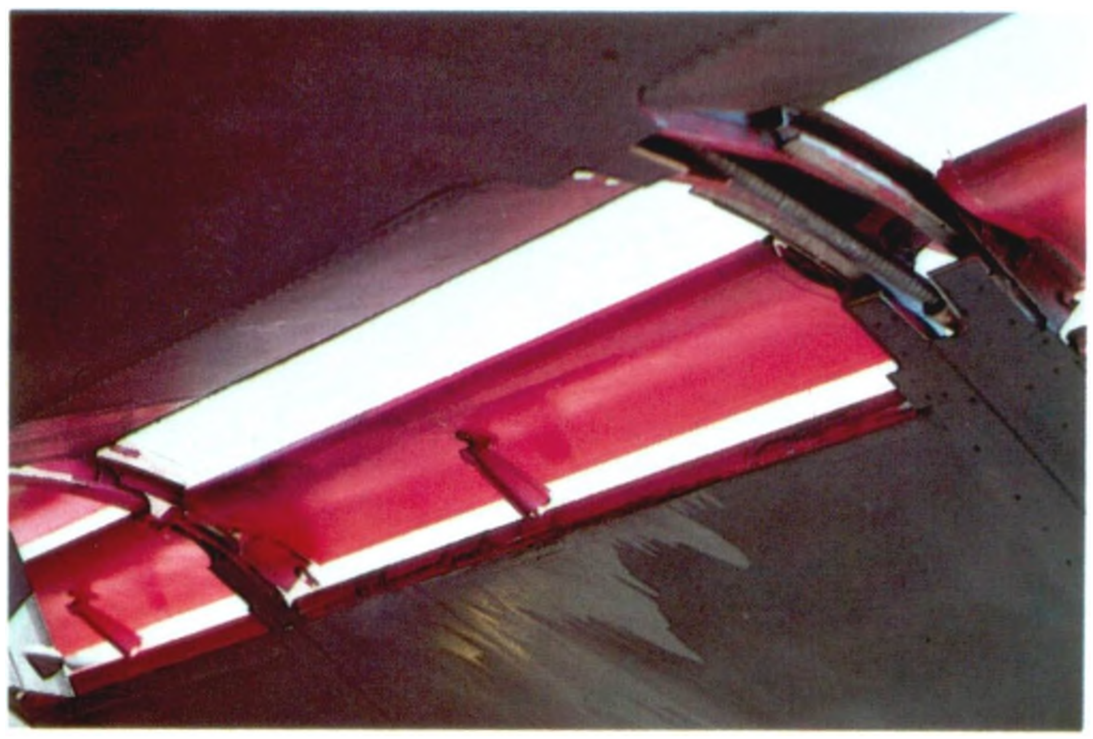
F-111E just before touchdown. *(General Dynamics)*

SLATS, FLAPS, & GLOVES

Open glove vane on the right side. (Miklasevich)

Underside of the inboard section of the right leading edge slat. (Miklasevich)

Right wing showing extended flaps and slats. (Leader)



Underside of extended flaps showing two of the flap tracks and the center section of the flap. (Miklasevich)

Raised spoilers on the left wing. (Miklasevich)

Extended slats and flaps from above. (Rotramel)

EF-111 COLORS

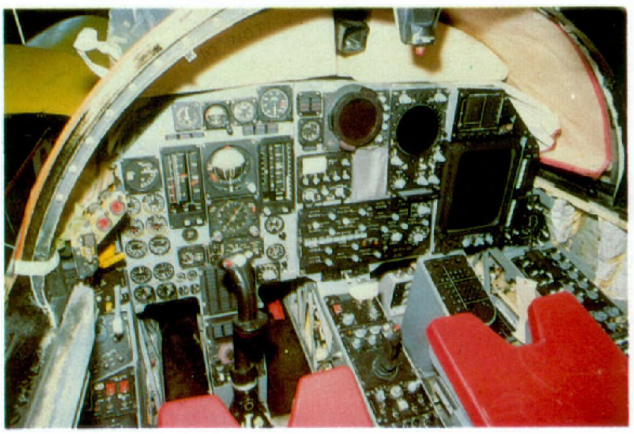
EF-111A, 66-0049, in its colorful red, white, and blue scheme. *(Rotramel)*

Left side of 66-0049 in the same colorful scheme as shown at left. *(Rotramel)*

EF-111A, 66-0041, in an overall gray scheme with red markings. *(Grumman)*

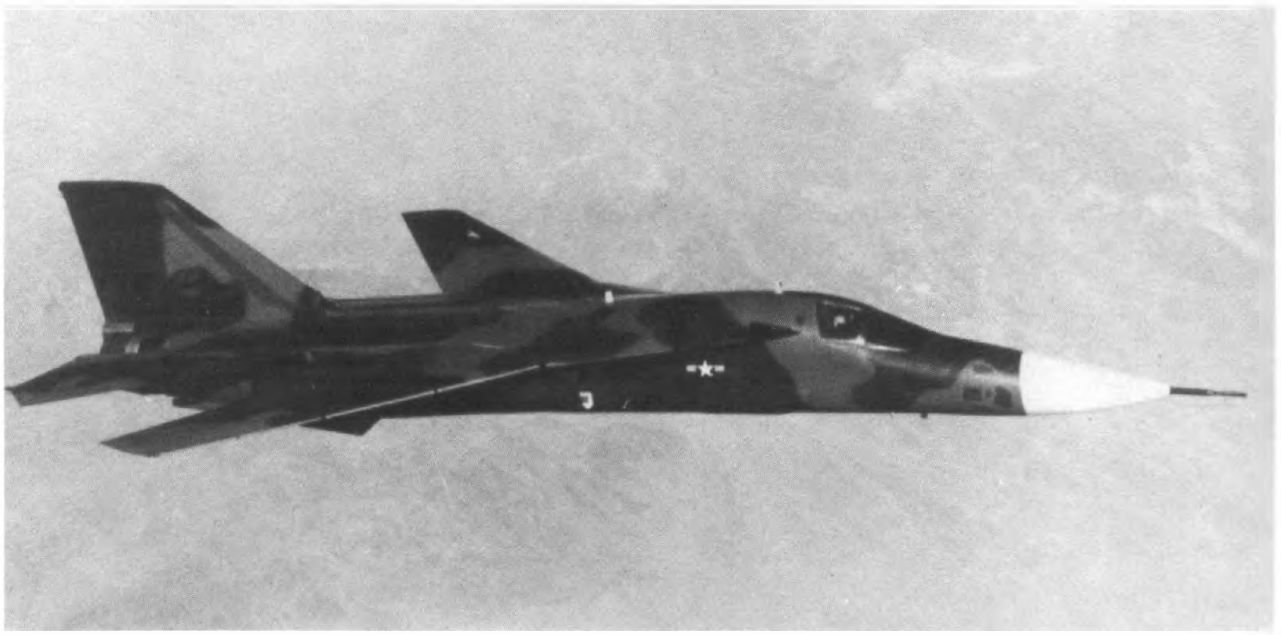
EF-111A, 66-0041, in the same gray scheme as at left, but with the red markings removed. *(Grumman)*

EF-111A, 66-0049, in a two-tone gray scheme with subdued insignias. *(Grumman)*

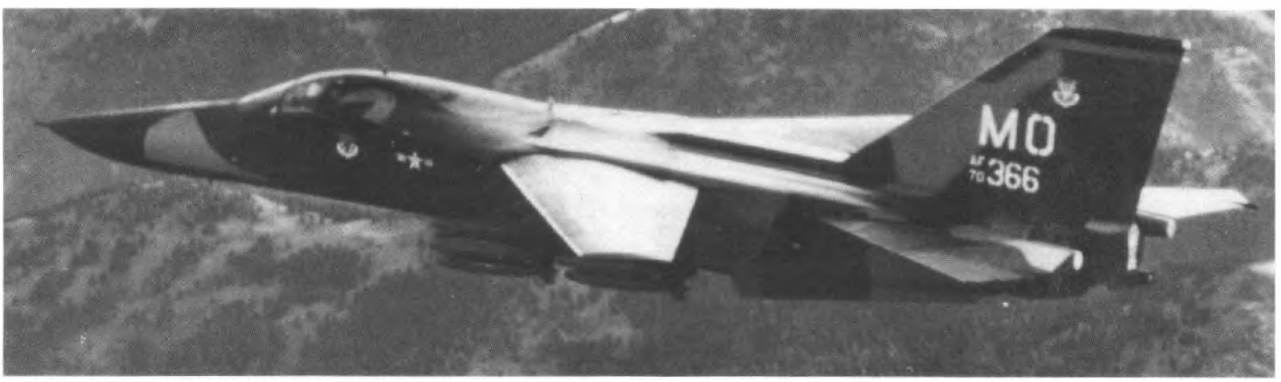


Cockpit of an EF-111A. *(Grumman)*

F-111D number 3 (foreground) and number 12 in flight. Notice that 68-087 has a SUU-20 practice dispenser under the wing, while 68-096 has two Sidewinder missiles. (General Dynamics)



The first F-111E, 67-0115, in flight. Note the unusual combination of a white radome on a camouflaged aircraft. (General Dynamics)



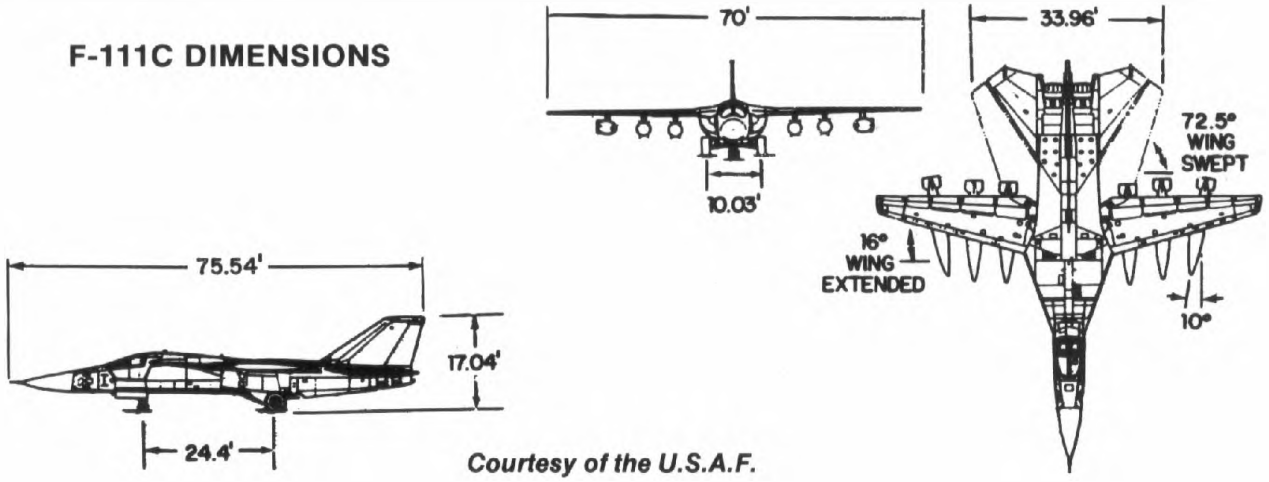
F-111F, 70-2366, the fifth F-111F built, flies over rocky terrain with a load of 500 pound bombs. At the time this photo was taken, the aircraft was based at Mountain Home AFB, Idaho, but since then all F-111Fs have been transferred. They are now assigned to the 48th TFW, Lakenheath, England. (General Dynamics)

DIMENSIONS

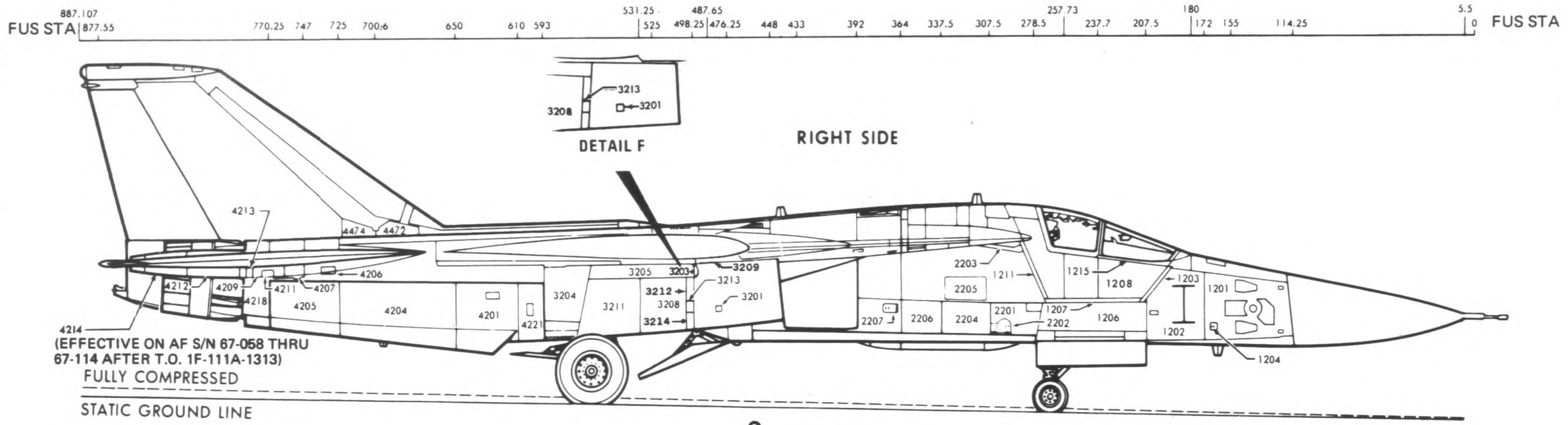
General	
Overall Wingspan	63 ft
Overall Length	75 ft, 6.5 in.
Overall Height (at vertical fin tip)	17 ft, 0.5 in.
Fuselage Width (glove maximum width)	16 ft, 1.6 in.
Wings (sweep 16 degrees)	
Total Wing Area (L & R) (not including glove area)	525.0 sq ft
Total Wing Area (17 percent) flap extension) (L & P)	589.2 sq ft
Total Wing Area (wings swept 72-1/2 degrees)	632.3 sq ft
Mean Aerodynamic Chord	108.5 in.
Aspect Ratio	7.56
Aspect Ratio (wings swept 72-1/2 degrees)	1.337
Taper Ratio	0.325
Sweep Angle (1/4 chord line)	12 degrees 12 seconds
Dihedral Angle (outboard of span station 83.55)	1 degree
Angle of Incidence of Root-to-Fuselage Reference Line	1 degree
*Flaps (double-slotted Fowler)	
Distance CL to Inboard Edge	97.32 in.
Distance CL to Outboard Edge	356.96 in.
Maximum Deflection	40 degrees
Deflection for Takeoff and Landing	35 or 40 degrees
Total Area Stowed (L & R)	108 sq ft
**Flaps (double-slotted Fowler)	
Distance CL to Inboard Edge	95.46 in.
Distance CL to Outboard Edge	362.62 in.
***Maximum Deflection	37.5 degrees
Total Area Stored (L & R)	117.8 sq ft
Vanes	
*Total Area Stowed (L & R)	33 sq ft
**Total Area Stowed (L & R)	34.5 sq ft
Deflection	20 degrees
Rotating Glove	
Deflection	15 degrees
Spoilers	
*Total Area Stowed (L & R)	47.8 sq ft
** Total Area Stowed (L & R)	28.6 sq ft
Deflection	45 degrees
Slats (leading edge)	
*Total Area Stowed (L & R)	59.20 sq ft
** Total Area Stowed (L & R)	60.7 sq ft
Deflection	
No. 1 & 2 Inboard	50 degrees
No. 3 & 4 Outboard	45 degrees
Horizontal Tail (all movable)	
Total Area (movable) (L & R)	154.2 sq ft
Total Area (exposed) (L & R)	174.3 sq ft
Span	107.80 in
Aspect Ratio	1.419
Incidence-to-Fuselage Reference Line	-1 degree
Dihedral Angle	-1 degree
Taper Ratio (Exposed)	0.334
Deflection	
Trailing Edge (UP)	30 degrees
Trailing Edge (DOWN)	15 degrees
Mean Aerodynamic Chord	137.50 in.
Vertical Tail	
Mean Aerodynamic Chord	159.46 in.
Total Area	111.7 sq ft
Span	106.85 in.
Taper Ratio	0.411
Aspect Ratio	1.419
Thickness Ratio	3.204 percent
Rudder Area	29.3 sq ft
Rudder Deflection From Neutral	30 degrees
Strakes	
Total Area (L & R)	25 sq ft
Speedbrakes	
Total Area	26.3 sq ft
Deflection (Maximum)	77 degrees 40 seconds

*On AF S/N 65-5701 thru 66-012
**On AF S/N 66-013 thru 67-114
***On AF S/N 66-013 thru 67-114 after T.O. 1F-111-824 the flap deflection is limited to 34 degrees.

F-111C DIMENSIONS

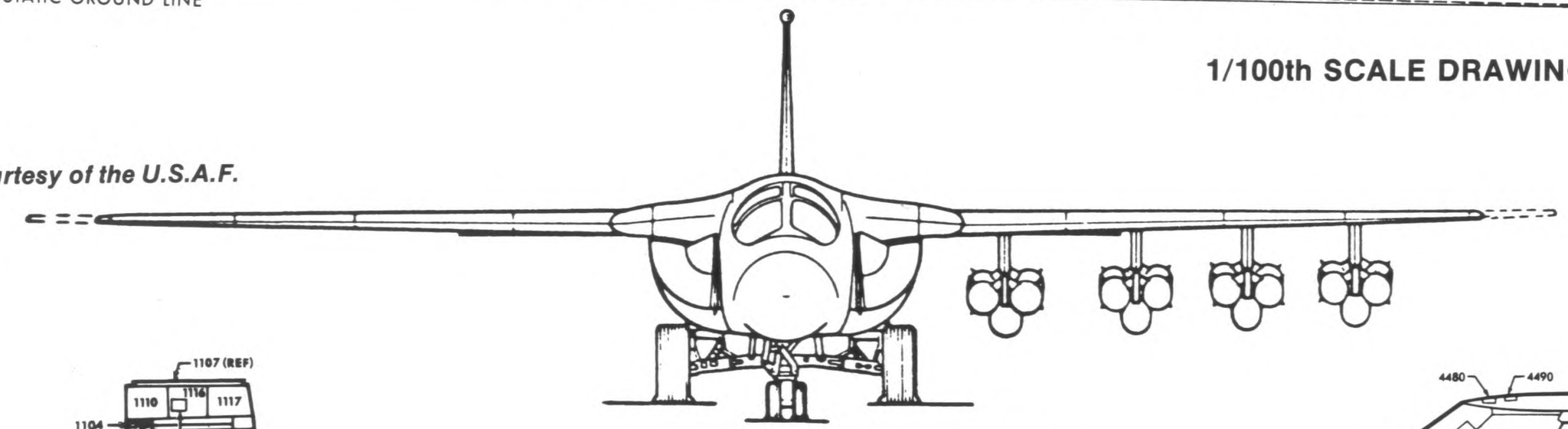


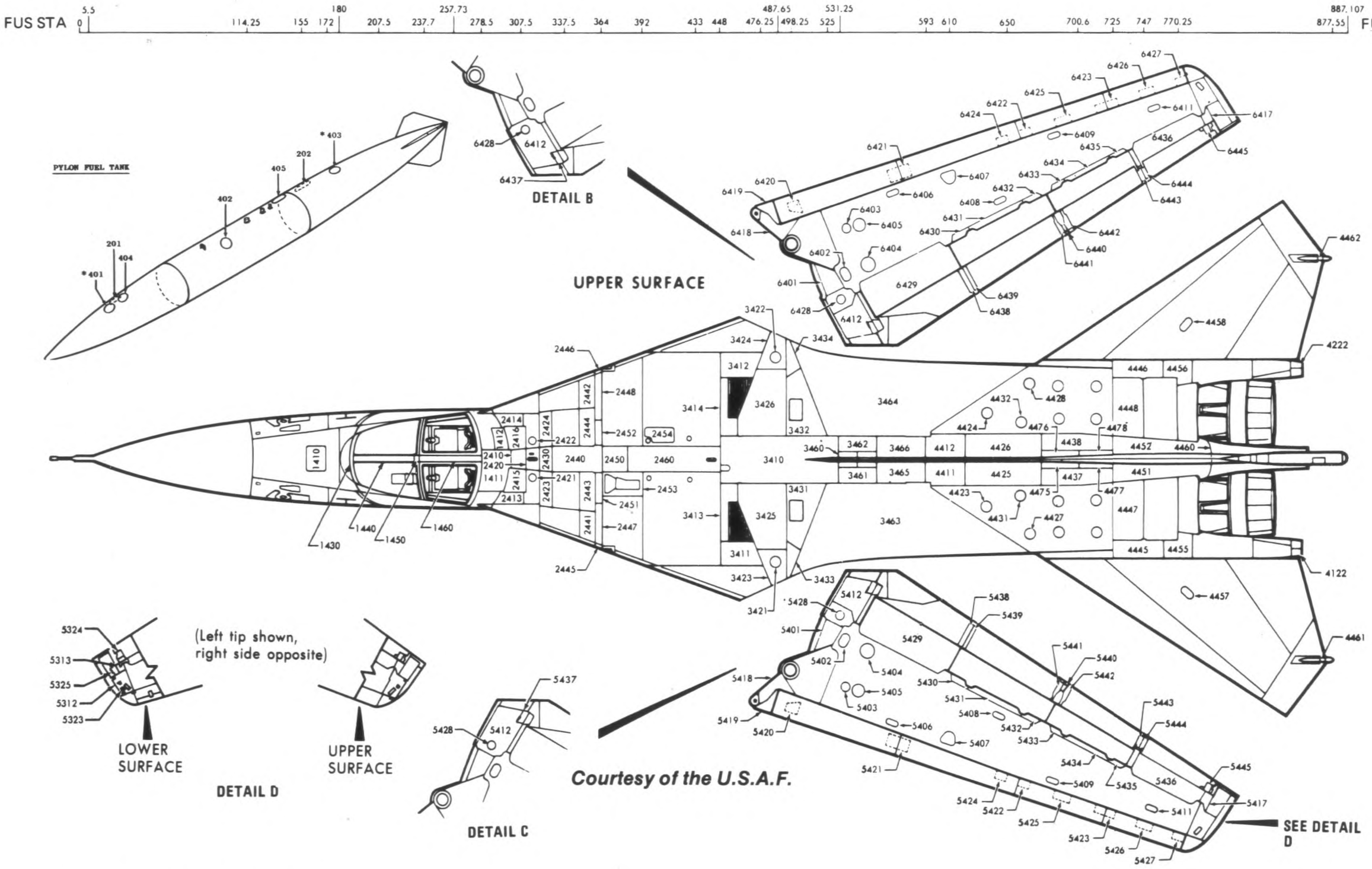
Courtesy of the U.S.A.F.



1/100th SCALE DRAWINGS

Courtesy of the U.S.A.F.





Courtesy of the U.S.A.F.

1/100th SCALE DRAWINGS

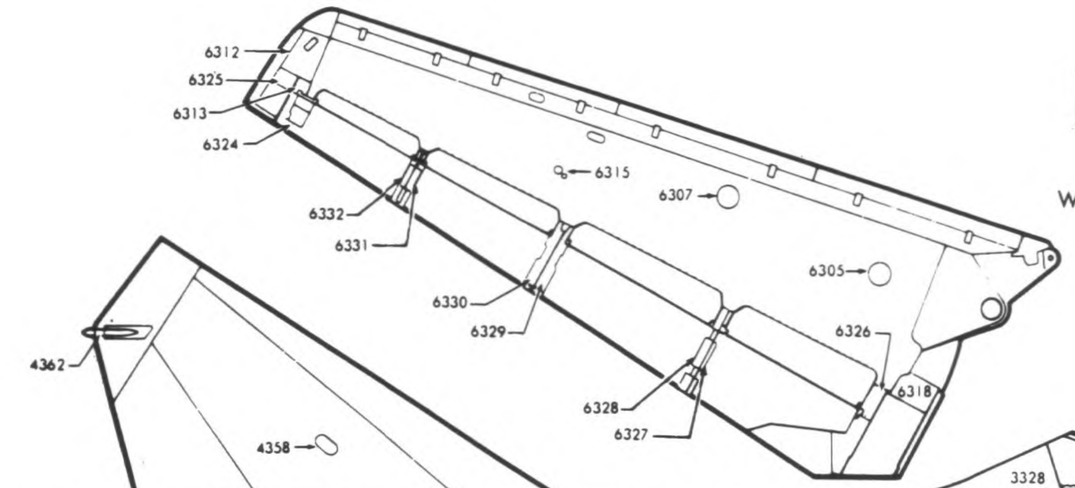
FB-111A
SRAM Pylon Pivot

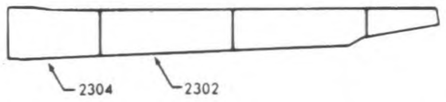
FB-111A
Tank Pylon Pivot

FB-111A
Tank Pylon Fixed

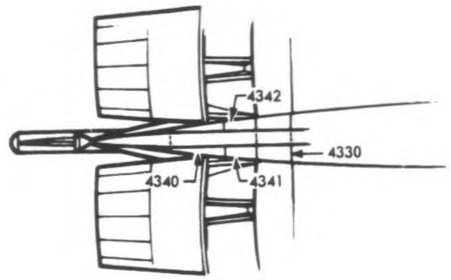
F-111
Pivot Pylon

F-111
Fixed Pylon



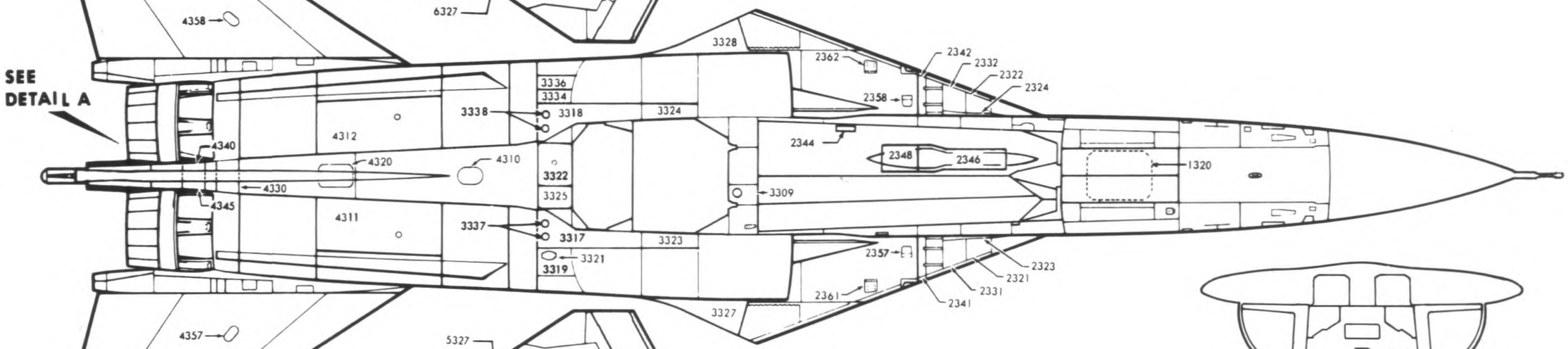


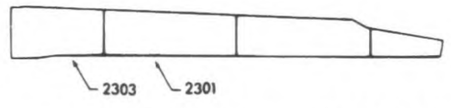
WEAPONS BAY SIDEWALL (RIGHT SIDE)



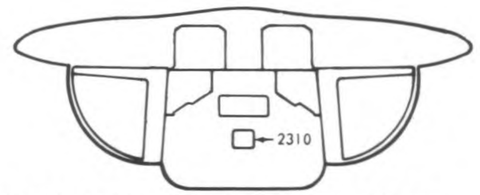
DETAIL A
SEE NOTE 4

LOWER SURFACE

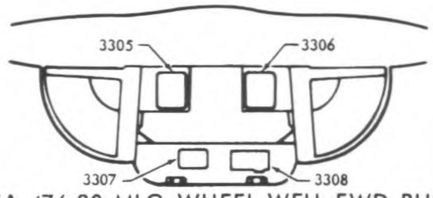




WEAPONS BAY SIDEWALL (LEFT SIDE)



FUS STA 460.05 WEAPONS BAY AFT BHD
(VIEW LOOKING AFT)



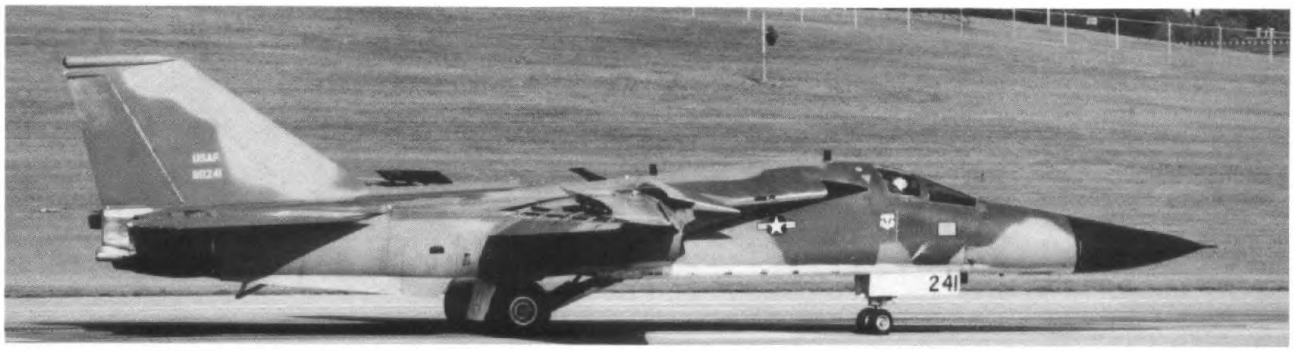
FUS STA 476.80 MLG WHEEL WELL FWD BHD
(VIEW LOOKING FWD)

1/100th SCALE DRAWINGS

FUS STA 887.55 (887.107) 770.25 747 725 700.6 650 610 593 525 (531.25) 498.25 (487.65) 476.25 448 433 392 364 337.5 307.5 278.5 (257.73) 237.7 207.5 172 (180) 155 114.25 0 (5.5) FUS STA

Courtesy of the U.S.A.F.

FB-111A



FB-111A, 68-0241, of the 509th Bomb Wing. Note the flaps, slats, and raised spoilers. (Cockle)

Beginning in early 1963, the TFX was envisioned as an aircraft that could be built not only as a fighter-bomber for the Air Force and a fleet defense fighter for the Navy, but as a strategic bomber for SAC as well.

The FB-111A was based on the F-111A, except that it had the longer wings of the F-111B, a longer fuselage of 75 feet, 6 inches (a two feet, one inch increase over the F-111A), stronger landing gear, extra fuel, and P-7 engines. Additionally, an improved and expanded avionics system was fitted. In addition to nuclear bombs, the FB-111A was also to carry the AGM-69A short range attack missile. But even from the beginning it was recognized that the FB-111A would not truly be an intercontinental bomber. It was to be an interim bomber to bolster SAC's forces of the aging B-52s. It is interesting to note that this was in 1963, and almost twenty years later the B-52 is still SAC's primary strategic bomber.

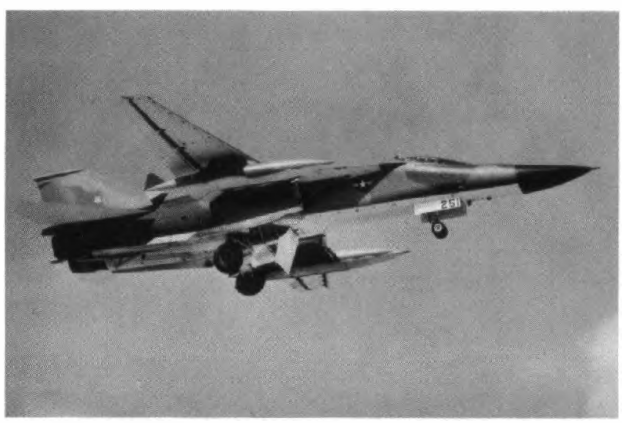
On December 10, 1965, Secretary McNamara publicly announced the plans for the FB-111A, and it was added to the F-111A RDT&E contract. The eighteenth RDT&E F-111A was used as the FB-111A prototype, and even though it was still equipped with the tactical landing gear and P-1 engine, it made its first flight on July 31, 1967. During this flight it exceeded Mach 2.

The first two FB-111As used the original intake configuration, but, beginning with the third aircraft, the Triple Plow II air diverter was installed. However this reduced the range of the FB-111A, a range that was already minimal for a strategic bomber.

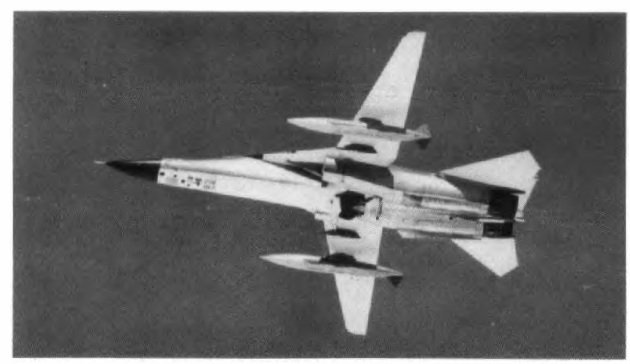
The first production aircraft made its initial flight on July 13, 1968, and was accepted by the Air Force on August 30. A planned producted of 263 aircraft was to follow. This was cut to 126 on November 28, 1968, and then to 76 in March of the following year. The first six FB-111As were all originally scheduled for test and evaluation, but would be added to the operational inventory when testing was complete.

The seventh FB-111A was the first to enter operational service on October 8, 1969 with the 340th Bomb Group at Carswell AFB. Initial operational capability was reached by the 509th Bomb Wing at Pease AFB in October 1971, with the second wing, the 308th Strategic Aerospace Wing at Plattsburg AFB, becoming operational in 1972.

By June 30, 1971, 75 of the 76 FB-111As had been delivered. One aircraft had crashed before being delivered.



FB-111A, 68-0251, of the 509th Bomb Wing making a low approach with it "all hanging out." (Cockle)



Looking up at FB-111A, 68-0281, from the 380th Bomb Wing. Note the main landing gear doors just about to close and the arrangement of antennas under the nose. (Cockle)

FB-111A TECHNICAL DATA

Development

The FB-111A is the bomber version of the F-111A. Major differences include TF30-P-7 engines, a 3.5 foot extension on each wing tip, nose and main landing gear along with adjacent fuselage structure has been strengthened to meet higher gross weight requirements, increased external jettisonable fuel tank capability, AGM-69 delivery capability and additional avionics equipment.

Date of Contract	Dec 66
First Flight (Prototype)	Jul 67
First Acceptance (Production)	Aug 68
Production Completed	Jun 71
Total Production Aircraft Contracted For	76

POWER PLANT

No. & Model	(2) TF30-P-7
Mfr	Pratt & Whitney
Engine Spec No.	A-6118
Type	Twin Spool, Turbofan
Length	241.4 in
Diameter (compressor face)	38.12 in
Weight (dry)	4121 lb
Nozzle	Variable Area, Blow-in Door Ejector
Augmentation	Afterburning

FUEL

Location	No. Tanks	Gal
Wg, int	2	778
Fus, fwd	1	2808
Fus, aft	1	1424
Fuel lines	-	28
L. Weapons Bay	1	285
R. Weapons Bay	1	300
Wg, ext, drop	6	3600
	Total	9223

Grade: JP-4
Specification: MIL-T-5624

OIL

Engine: 4 gal/eng (tot) 8
Specification: MIL-L-7808

WEIGHTS

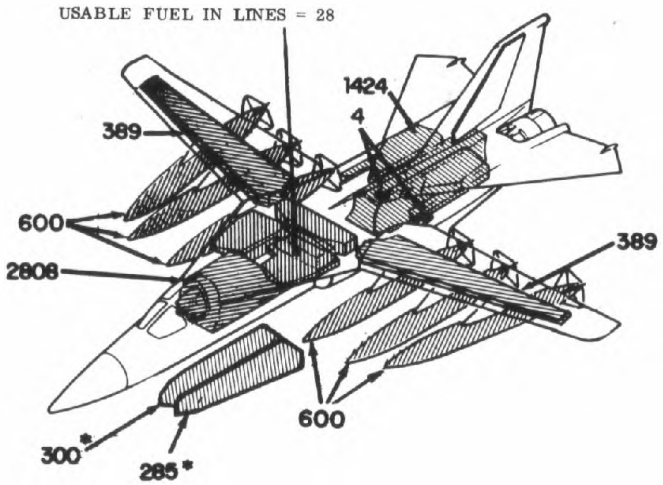
Loading	Lb	L. F.
Empty	47,481(C)	
Basic	49,090(C)	
Design	110,646	3.0
Combat	*70,380	
Max T.O. (overload)	† 119,243	2.0
Max T.O. (normal)	† 114,300	2.0
Max Land	∓ 109,000	

(C) Calculated
* For Basic Mission
† Limited by performance
∓ 8 ft/sec rate of sink

ENGINE RATINGS

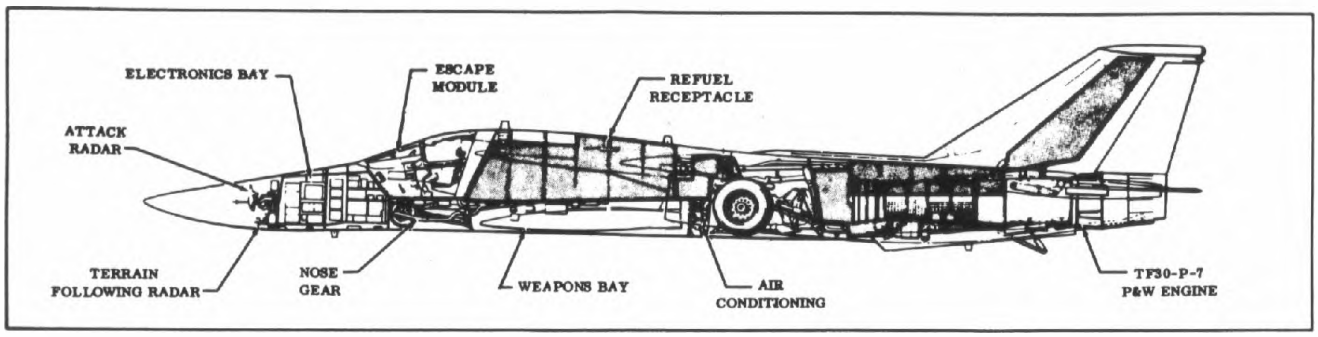
S.L. Static	LB	-	RPM	-	MIN
Max:	*20,350	-	14,550	-	45
Intermed:	12,350	-	14,400	-	45
Max Cont:	10,800	-	14,150	-	Cont

* With afterburner operating



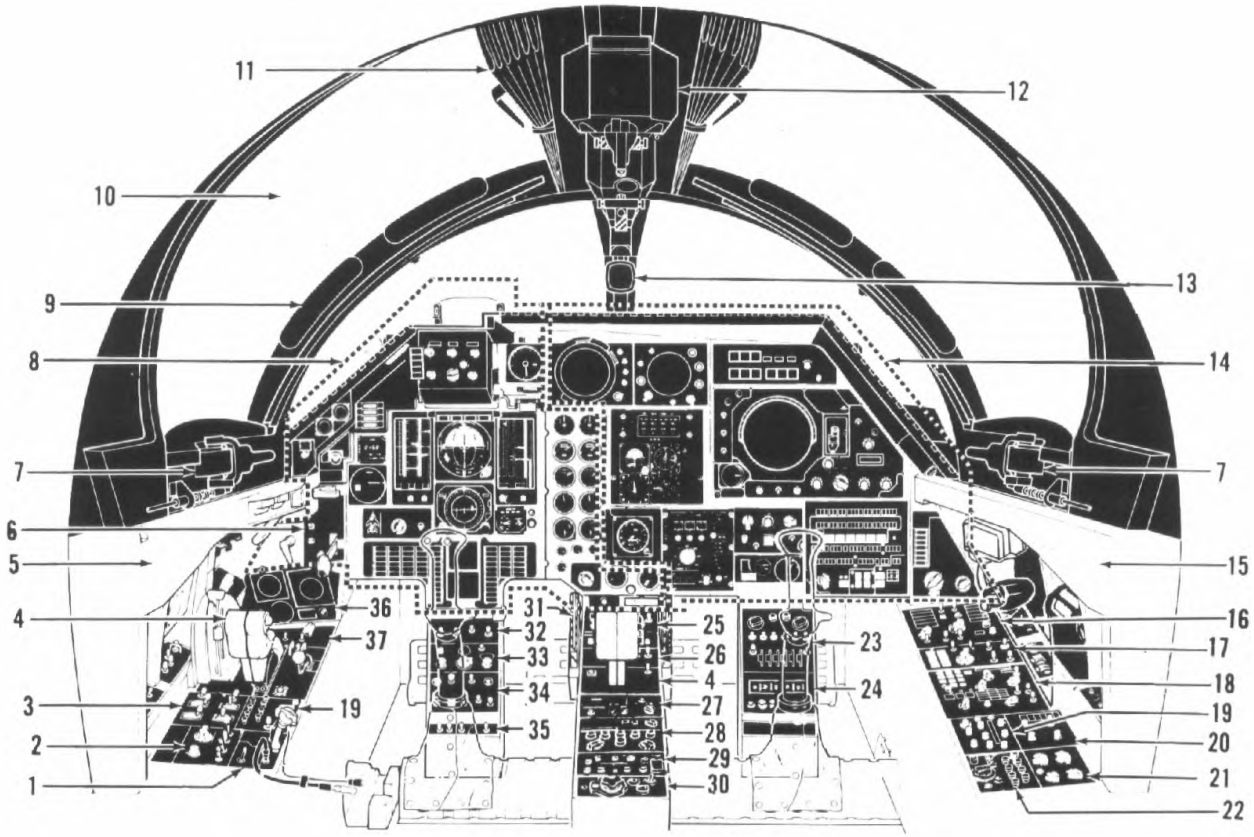
ELECTRONICS

Mission & Traffic Control	
UHF Command Radio	AN/ARC-109
HF Radio	AN/ARC-123
Radio Beacon	AN/URT-33
Interphone	AN/AIC-25
IFF (AIMS)	AN/APX-64(V)
IFF	AN/APX-78
ILS	AN/ARN-58A
TACAN	AN/ARN-52(V)
Penetration Aids	
ECM	AN/ALQ-94
IR Receiving Set	AN/AAR-34
RHAWS	AN/APS-109B
CMRS	AN/ALR-41
CMDS	AN/ALE-28
Fire Power Control	
Inertial Bomb Nav Sys	AN/AJN-16
GD Digital Computer	AN/AYK-6
HSD	AN/AYN-3
Optical Display Sight	AN/ASG-25
Attack Radar	AN/APQ-114
Radar Altimeter	AN/APN-167
Terrain Following Radar	AN/APQ-134
Doppler Radar	AN/APN-185
Astrocompass	AN/ASQ-119

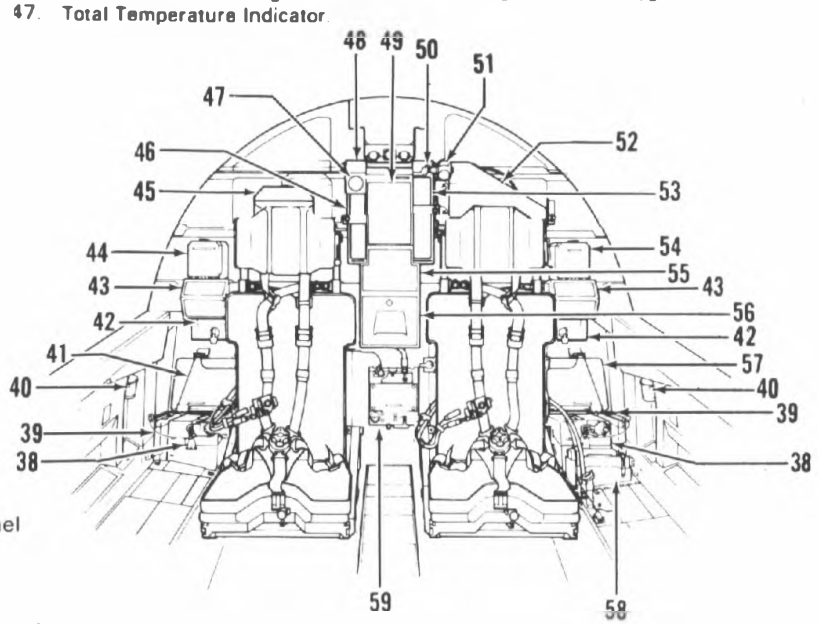


Courtesy of the U.S.A.F.

FB-111A COCKPIT

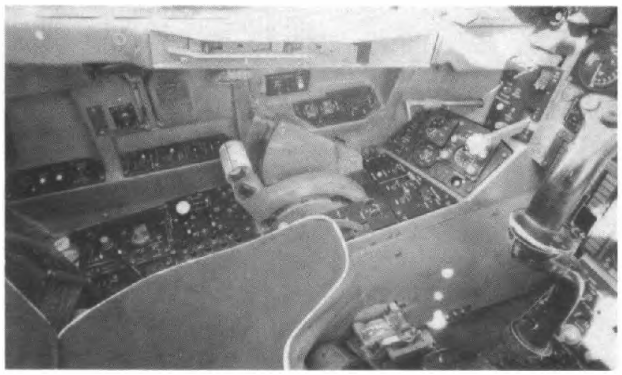


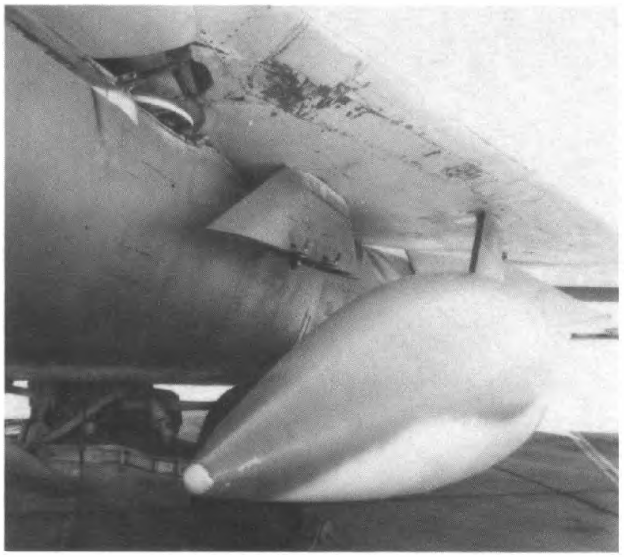
1. Left Station Oxygen Control Panel
2. Air Conditioning Control Panel
3. Autopilot Damper Panel
4. Throttle Panels
5. Left Sidewall
6. Landing Gear Control Panel
7. Internal Canopy Latch Handle (2).
8. Left Main Instrument Panel
9. Mirrors (4).
10. Canopy Hatches (2).
11. Thermal Curtains (2).
12. Canopy Center Beam Assembly
13. Magnetic Compass.
14. Right Main Instrument Panel
15. Right Sidewall
16. Store Control Panel
17. SRAM Control Panel
18. Computer Control Panel
19. HF Radio Control Panel
20. CMDS Control Panel.
21. AN/ALQ-137 ECM Control Panel.
22. Communications Panel
23. IFF Control Panel
24. Coded Switch Set Controller Panel
25. Fuel Control Panel
26. TFR Control Panel
27. TACAN Control Panel
28. UHF-2 Radio Control Panel
29. UHF-1 Radio Control Panel
30. ILS Control Panel
31. Ejection Handles (2).
32. Windshield Wash/Anti-Icing Control Panel
33. Compass Control Panel
34. Electrical Control Panel
35. Antenna Select Panel
36. Auxiliary Gage Panel
37. Miscellaneous Switch Panel
38. Mission Data Box (2).
39. Relief Container (2).
40. Drinking Cups (2)
41. Weight and Balance T.O. and Flight Record Stowage.
42. Food and Liquid Stowage (2)
43. Air Diffusers (2)
44. Spare Bulb Stowage
45. Hood Stowage.
46. Letdown Chart Stowage.
47. Total Temperature Indicator.
48. Internal Lighting Fuse Panels (2)
49. Lighting Control Panel
50. Cabin Air Distribution Control Lever.
51. Utility Light.
52. Quick Rescue Kit.
53. Letdown Chart Holder Stowage
54. Safety Pin Stowage.
55. Circuit Breaker Panel
56. Ground Check Panel
57. Manual Stowage.
58. Arrival and Inflight IFR Chart Stowage.
59. Right Station Oxygen Control Panel



Courtesy of the U.S.A.F.

FB-111A DETAILS

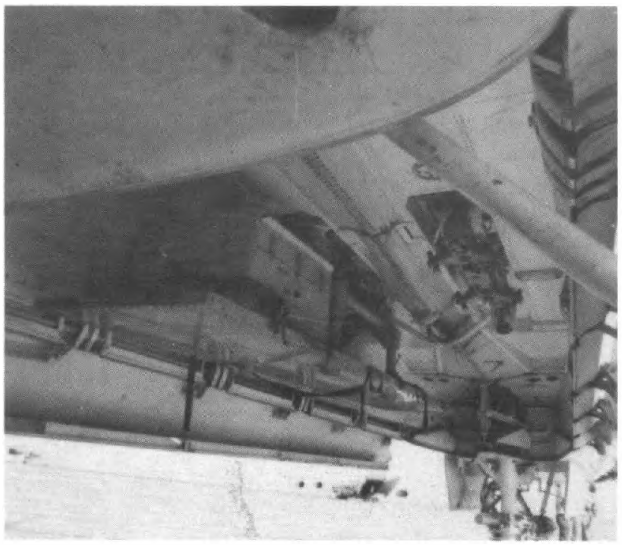


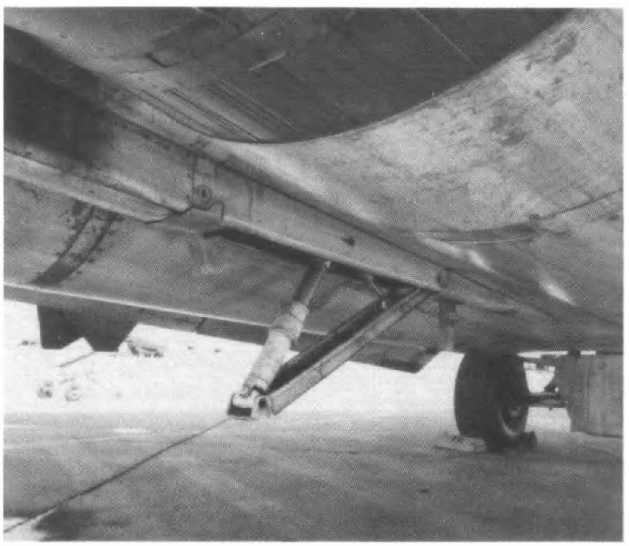


Above left: Left console and sidewall.
Above: Right console and sidewall. For instrument panel details, see the rear cover.
Left: Left wing with fuel pylons and 600 gallon fuel tank. Note how close the inboard pylon is to the fuselage.

Below left: Bomb bay looking forward.

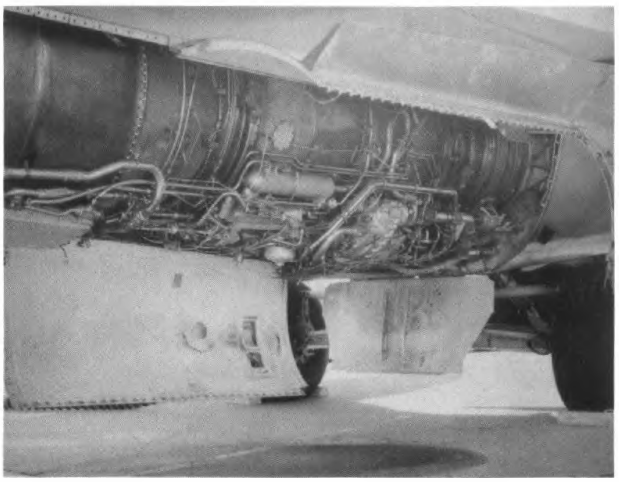
Below: Tail bumper skid detail.

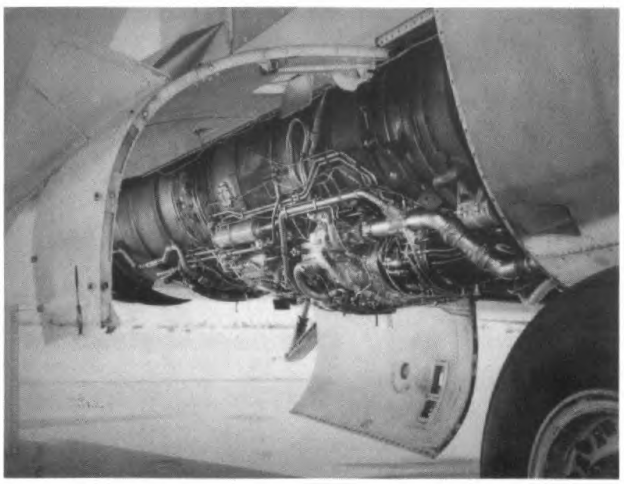




Open radome showing attack radar dish and terrain following radar domes beneath. *(Cockle)*

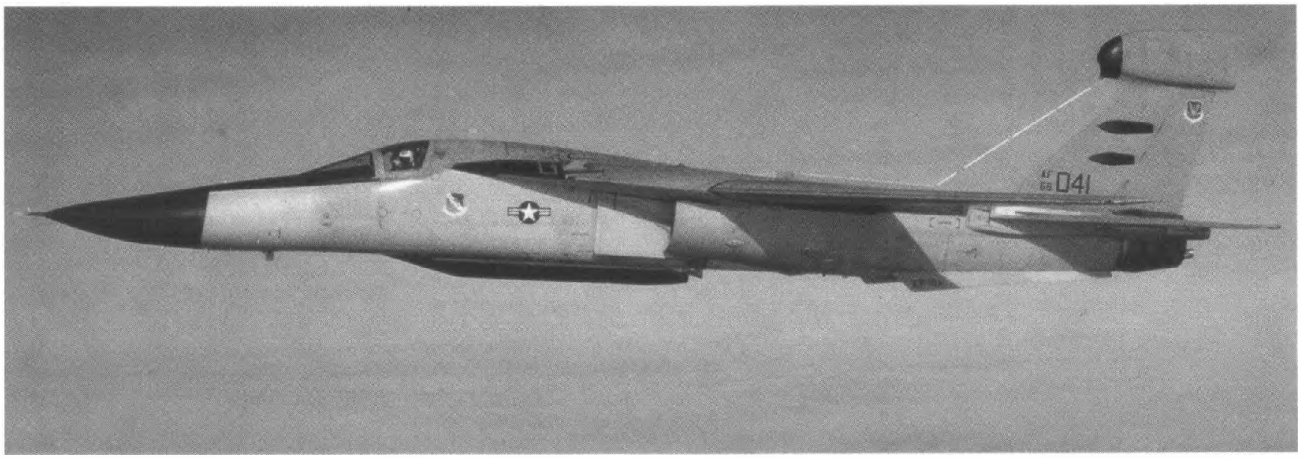
Two detailed photographs showing the open equipment bays on both sides of the nose of an FB-111A. Note the open boarding ladder in the left photo. On TAC F-111s this ladder is welded shut. *(Cockle)*





Two views of the right P-7 engine on an FB-111A shown with the access doors open. *(Cockle)*

EF-111A "SPARK VARK"



EF-111A, 66-041, in a two-tone gray scheme, displays many of the new antennas that make it the U.S. Air Force's most potent tactical jamming aircraft. ***(Grumman)***

During the war in Vietnam the U.S. Navy possessed the best electronic jamming aircraft in the world. This aircraft, the EA-6B Prowler, utilized the ALQ-99 jamming system, and was clearly the better of the EB-66 and EB-57 aircraft utilized by the Air Force and which are now out of the inventory.

Since the end of that war, the Soviets have continually added new air defense radar and missile systems to their inventory, while upgrading the old ones. So dense and sophisticated have these systems become, that strike aircraft can no longer carry enough "on-board" jammers to adequately counter these threats. Thus, the Air Force recognized the need for a dedicated airborne tactical jamming system.

The use of the EA-6B by the Air Force was ruled out because of its subsonic speed, and it did not have the range that the Air Force wanted. But the Air Force was impressed with the ALQ-99 jamming system.

The solution was to mate the ALQ-99 with an aircraft with the speed and range required, and the aircraft chosen was the F-111A. Aircraft selected for modification averaged 2,000 hours on an airframe expected to last 10,000 hours. At present, 42 aircraft are planned, and this may be increased, a first for the F-111 program!

In late 1974, Grumman was selected as primary contractor because of its experience with the EA-6B Prowler, the ALQ-99 jamming system, and the F-111B. Two airframes were modified as prototypes, and were extensively tested at Eglin AFB and Mountain Home AFB.

On June 19, 1981, the first production EF-111A "Spark Vark" (or Electronic Fox as it is also called) was rolled out. In actuality this aircraft was the first prototype, 66-049, as modified based on the testing. It will be sent to Grumman's anechoic chamber for additional electromagnetic compatibility testing. The second prototype, 66-041, is to be the second production aircraft, and the first to be delivered to the Tactical Air Command. In November 1982, 66-049 will complete its anechoic chamber testing and follow 66-041 into service. Both aircraft will be assigned to the 388th Electronic Combat Squadron of the 366th Tactical Fighter Wing at Mountain Home AFB. Initial Operational capability is scheduled for November 1983.

The jamming system is an improved version over that used on the EA-6B, and is designated "ALQ-99E." It has room for growth to meet changing and increasing threats in the future. Additionally, there is a higher degree of automacity, thus requiring a crew of only two instead of the four in the EA-6B.

The Air Force sees three basic missions for the EF-111A. In the barrier/standoff mission, the aircraft flys on the friendly side of the battle line, and masks the friendly skies from enemy radars. Four or five EF-111As could jam the entire area along the NATO front from the Baltic to the Adriatic Sea. In the penetration/escort mission, the EF-111A would fly with strike aircraft deep into enemy territory to protect them from air defense systems. The third mission is the close air support mission where the EF-111A would protect aircraft supporting ground troops along the FEBA (Forward Edge of the Battle Area).

With its speed, range, loiter capability, and powerful ALQ-99E jamming system, the EF-111A promises to be an indispensable part of the Air Force's future. On today's sophisticated battlefield, electronic warfare is as important as putting bombs on the target.

EF-111A TECHNICAL DATA

Development

Official EF-111A Program "Go Ahead"	Nov 71
F-111A Modification Contractor selected	Dec 74
EF-111A Contract Date	Jan 75
Prototype Completion Date	Apr 78

POWER PLANT

No. & Model	(2) TF30-P-3
Mfr	Pratt & Whitney
Engine Spec No.	A-1809B
Type	Twin Spool, Turbofan
Length	241.7 in
Diameter (compressor face)	38.12 in
Weight (dry)	4062 lb
Nozzle	Variable Area, Blow-in Door Ejector
Augmentation	Afterburning

F U E L

Location	No. Tanks	Gal
Wg, int	2	778
Fus, fwd	1	2808
Fus, aft	1	1408
Fuel Lines	-	28
	Total	5022

Grade	JP-4
Specification	MIL-T-5624

OIL

Engine	4 gal/eng	(tot) 8
Specification	MIL-L-7808	

WEIGHTS

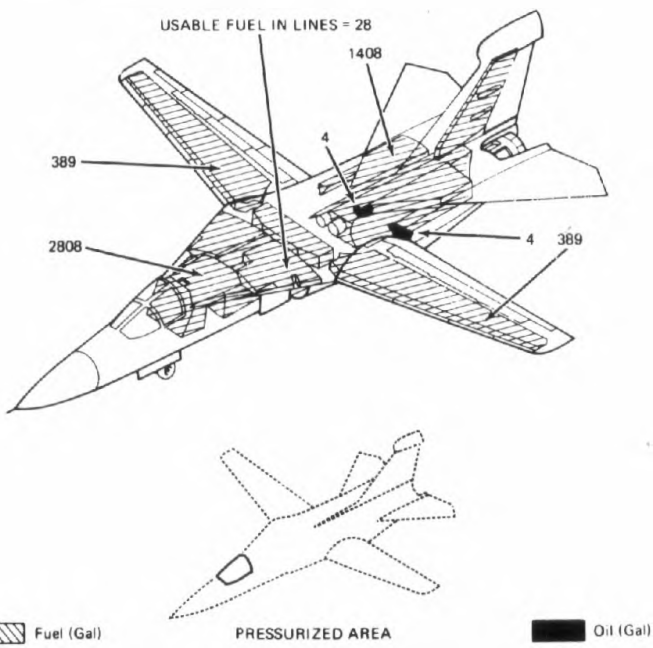
Loading	Lb	L.F.
Empty	53,418 (E)	
Basic	54,391 (E)	
Design	72,750	7.33
Combat	*61,729	
Max T.O.	†87,478	4.68
Max Land	†80,000	

(E) Estimated
* For Basic Mission
† With Full Internal Fuel
‡ 6 ft/sec rate of sink

ENGINE RATINGS

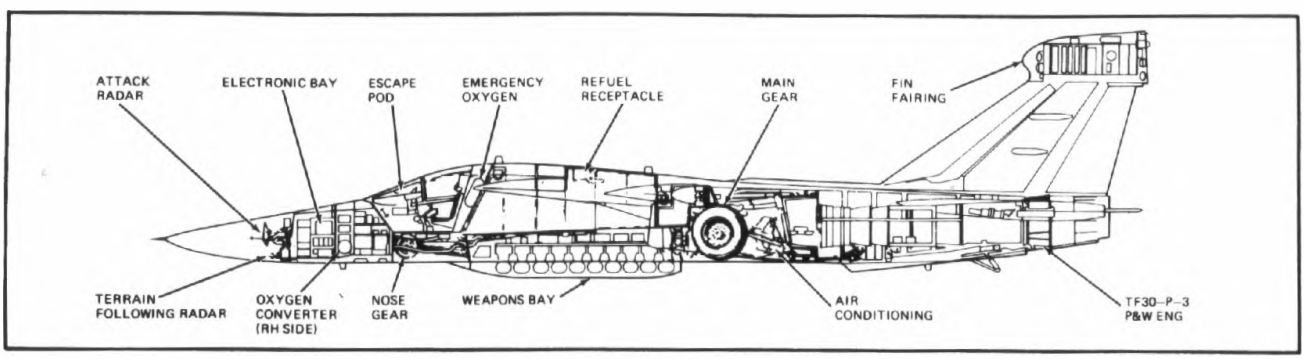
S.L.S.	LB	-	RPM	-	MIN
Max:	*18,500	-	14,400	-	45
Intermed:	10,750	-	14,350	-	45
Max Cont:	9800	-	14,030	-	Cont

* With Afterburner Operating



ELECTRONICS

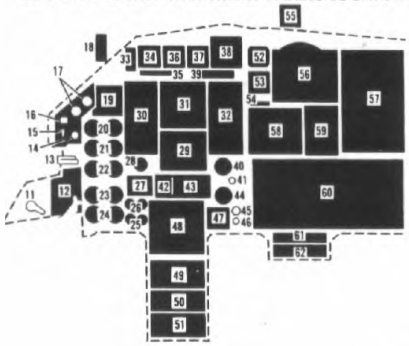
Mission and Traffic Control	
UHF Command	AN/ARC-109
Jamming Sub. Sys.	AN/ALQ-99 (Mod)
Inertial Nav. Sys.	AN/AJQ-20A
Attack Radar	AN/APQ-160
Radar Altimeter	AN/APN-167
Terrain Following Radar	AN/APQ-110
ILS	AN/ARN-58
HF Radio	AN/ARC-112
Interphone	AN/AIC-25
IFF (AIMS)	AN/APX-64
TACAN	AN/ARN-52
UHF/DF	AN/ARA-50
Penetration Aids	
SPS	AN/ALQ-137 (Mod)
TTWS	AN/ALR-62 (Mod)
CMRS	AN/ALR-23
CMDS	AN/ALE-28

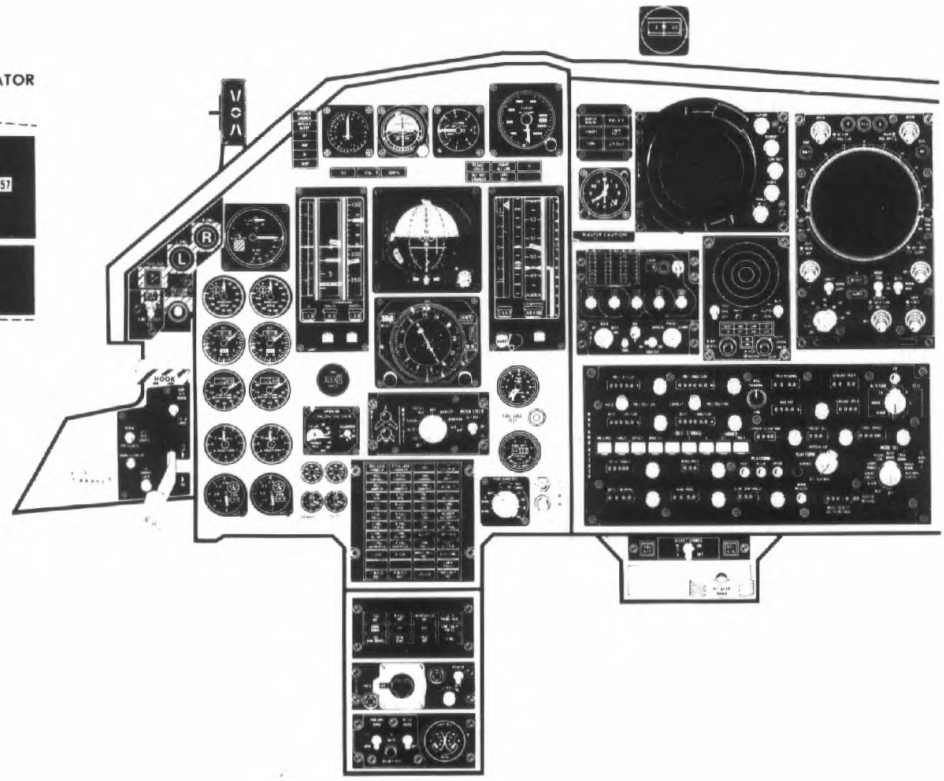


Courtesy of the U.S.A.F.

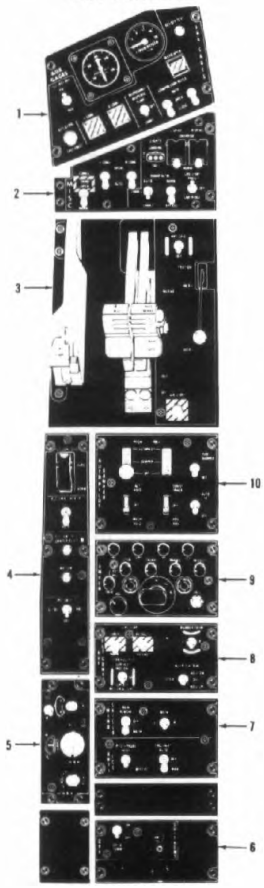
EF-111A COCKPIT

LEFT AND CENTER INSTRUMENT PANELS LOCATOR





LEFT CONSOLE



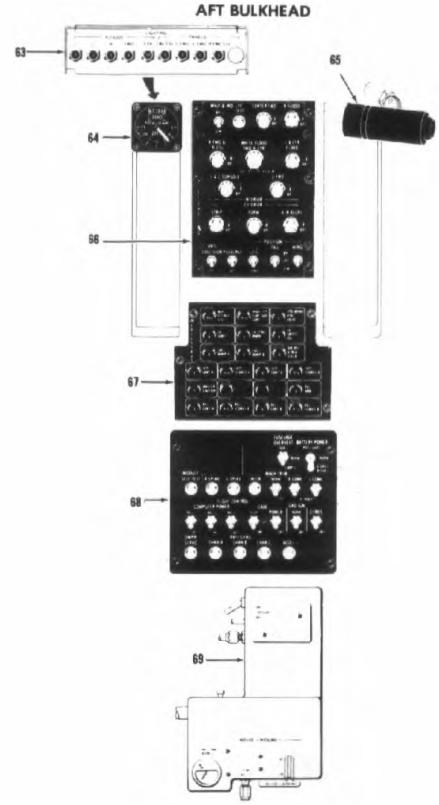
LEFT CONSOLE

1. AUXILIARY GAGE PANEL
2. MISCELLANEOUS SWITCH PANEL
3. THROTTLE PANEL
4. FLIGHT CONTROL TEST PANEL
5. COMPASS CONTROL PANEL
6. OXYGEN – SUIT CONTROL PANEL
7. WINDSHIELD WASH/ANTI-ICE CONTROL PANEL
8. AUXILIARY FLIGHT CONTROL PANEL
9. INTERPHONE CONTROL PANEL
10. AUTOPILOT DAMPER PANEL

LEFT AND CENTER INSTRUMENT PANELS

11. AUXILIARY BRAKE HANDLE
12. LANDING GEAR CONTROL PANEL
13. ARRESTING HOOK HANDLE
14. EXTERNAL STORES JETTISON BUTTON
15. AGENT DISCHARGE/FIRE DETECT TEST SWITCH
16. FUSELAGE FIRE PUSHBUTTON WARNING LAMP
17. ENGINE FIRE PUSHBUTTON WARNING LAMPS
18. ANGLE-OF-ATTACK INDEXER
19. WING SWEEP FLAP/SLAT POSITION INDICATOR
20. ENGINE TACHOMETERS
21. ENGINE TURBINE INLET TEMPERATURE INDICATORS
22. ENGINE FUEL FLOW INDICATORS
23. ENGINE NOZZLE POSITION INDICATORS
24. ENGINE PRESSURE RATIO INDICATORS
25. HYDRAULIC PRESSURE INDICATORS
26. ENGINE OIL PRESSURE INDICATORS
27. CONTROL SURFACE POSITION INDICATOR
28. TRUE AIRSPEED INDICATOR
29. HORIZONTAL SITUATION INDICATOR
30. AIRSPEED-MACH INDICATOR
31. ATTITUDE DIRECTOR INDICATOR
32. ALTITUDE-VERTICAL VELOCITY INDICATOR
33. THREAT INDICATOR
34. STANDBY AIRSPEED INDICATOR
35. LEFT STATUS INDICATOR
36. SELF CONTAINED ATTITUDE INDICATOR
37. STANDBY VERTICAL VELOCITY INDICATOR
38. RADAR ALTIMETER INDICATOR
39. RIGHT STATUS INDICATOR
40. FUSELAGE FUEL QUANTITY INDICATOR
41. FUEL QUANTITY INDICATOR TEST BUTTON
42. LANDING GEAR POSITION INDICATOR LAMPS
43. INSTRUMENT SYSTEM COUPLER CONTROL PANEL
44. TOTAL/SELECT FUEL QUANTITY INDICATOR
45. TAKEOFF TRIM INDICATOR LAMP
46. TAKEOFF TRIM BUTTON
47. FUEL QUANTITY INDICATOR SELECT KNOB
48. MAIN CAUTION LAMP PANEL
49. LOWER CAUTION LAMP PANEL
50. ILS CONTROL PANEL
51. RAM DOORS/OIL QUANTITY PANEL
52. ANNUNCIATOR INDICATOR
53. STANDBY ALTIMETER
54. MASTER CAUTION LAMP
55. MAGNETIC COMPASS
56. TFR SCOPE PANEL
57. NAV RADAR SCOPE PANEL
58. UHF RADIO CONTROL PANEL
59. TTWS CONTROL INDICATOR PANEL
60. INERTIAL NAV CONTROL PANEL
61. STORES JETTISON SELECT PANEL
62. LANDING GEAR EMERGENCY RELEASE HANDLE

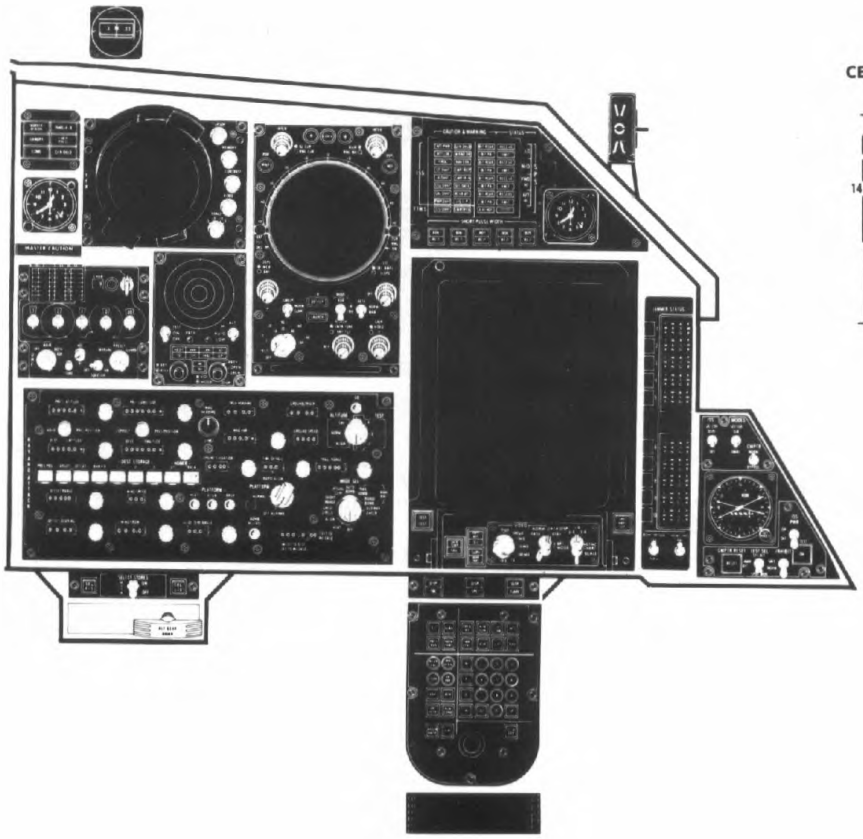
AFT BULKHEAD



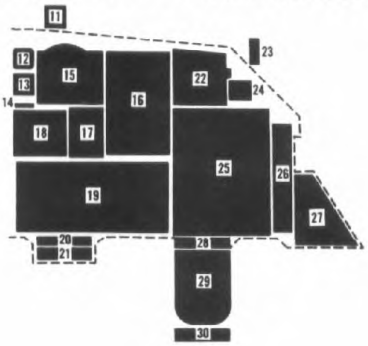
AFT BULKHEAD

63. INTERNAL LIGHTING CIRCUIT BREAKER PANEL
64. TOTAL TEMPERATURE INDICATOR
65. UTILITY LIGHT
66. LIGHTING CONTROL PANEL
67. DC CIRCUIT BREAKER PANEL
68. GROUND CHECK PANEL
69. OXYGEN SUIT CONTROL PANEL (EWO)

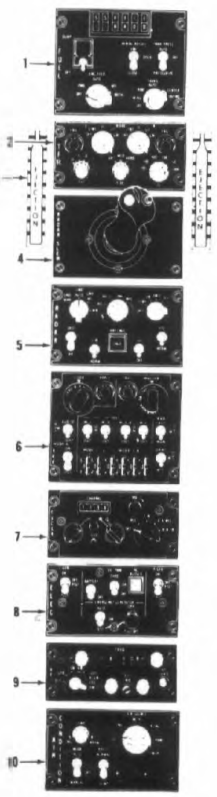
Courtesy of the U.S.A.F.



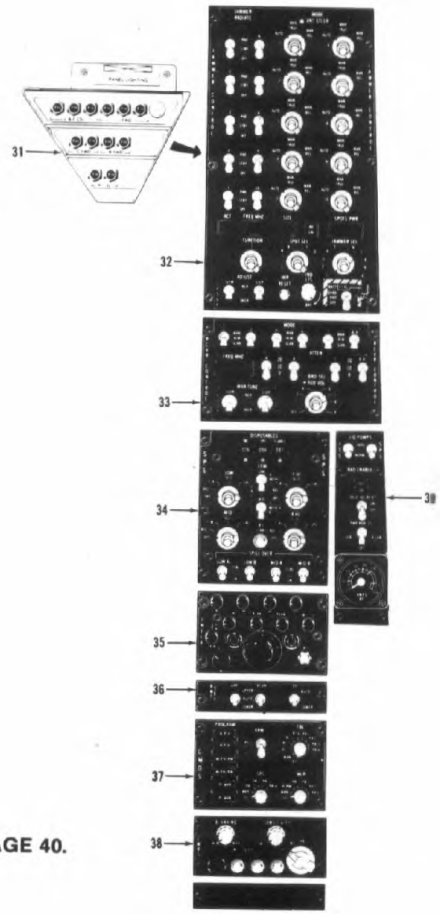
CENTER AND RIGHT INSTRUMENT PANELS LOCATOR



CENTER CONSOLE



RIGHT CONSOLE



CENTER CONSOLE

1. FUEL CONTROL PANEL
2. TFR CONTROL PANEL
3. EJECTION HANDLES (2)
4. NAV RADAR SLEW PANEL
5. NAV RADAR CONTROL PANEL
6. IFF CONTROL PANEL
7. TACAN CONTROL PANEL
8. ELECTRICAL CONTROL PANEL
9. HF CONTROL PANEL
10. AIR CONDITIONING CONTROL PANEL

CENTER AND RIGHT INSTRUMENT PANELS

11. MAGNETIC COMPASS
12. ANNUNCIATOR INDICATOR
13. STANDBY ALTIMETER
14. MASTER CAUTION LAMP
15. TFR SCOPE PANEL
16. NAV RADAR SCOPE PANEL
17. TTWS CONTROL INDICATOR PANEL
18. UHF RADIO CONTROL PANEL
19. INERTIAL NAV CONTROL PANEL
20. STORES JETTISON SELECT PANEL
21. LANDING GEAR EMERGENCY RELEASE HANDLE
22. JSS/SPS WARNING AND CAUTION PANEL
23. ANGLE-OF-ATTACK INDEXER
24. CLOCK
25. DIGITAL DISPLAY INDICATOR
26. JAMMER STATUS PANEL
27. JSS MODES SELECT PANEL
28. DISPOSABLES CONTROL PANEL
29. DIGITAL DISPLAY INDICATOR CONTROL PANEL
30. STOWAGE BAG

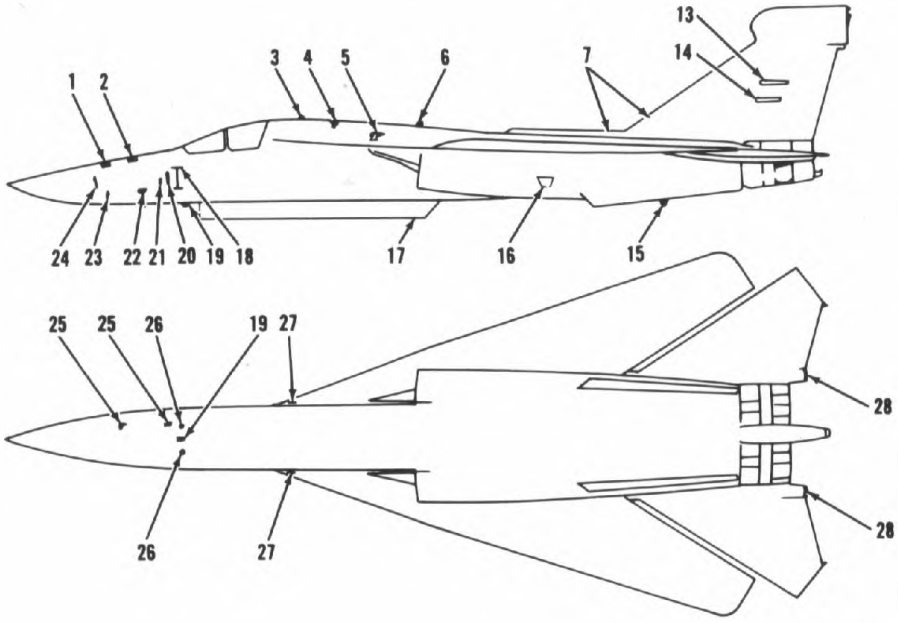
RIGHT CONSOLE

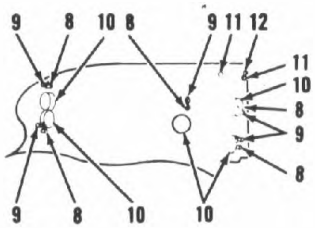
31. INTERNAL LIGHTING CIRCUIT BREAKER PANEL
32. JAMMER CONTROL PANEL
33. RECEIVER CONTROL PANEL
34. SPS CONTROL PANEL
35. INTERPHONE CONTROL PANEL
36. ANTENNA SELECT PANEL
37. CMDS CONTROL PANEL
38. CMRS CONTROL PANEL
39. COOLING AND POWER MONITOR PANEL

FOR A PHOTO OF THE EF-111A COCKPIT SEE PAGE 40.

Courtesy of the U.S.A.F.

ANTENNA LOCATIONS





1. GLIDE SLOPE
2. ADF
3. IFF (UPPER) AND UHF DATA LINK
4. RADIO BEACON SET
5. ALQ-137 LOW, MID, HIGH REC AND ALR-62 FWD REC
6. UHF NO. 1 AND TACAN UPPER
7. HF
8. ALQ-99 BAND 9
9. ALQ-99 BAND 8
10. ALQ-99 BANDS 4, 5/6 AND 7
11. ALR-62 AFT REC
12. ALQ-137 LOW AND MID REC
13. ALQ-99 BAND 1 (2)
14. ALQ-99 BAND 2 (2)
15. IFF LOWER
16. ALQ-99 BANDS 1 AND 2 (2)
17. ALQ-99 BANDS 4, 5/6, 7, 8 AND 9
18. LOCALIZER (2)
19. UHF NO. 2 AND TACAN LOWER
20. ALQ-137 LOW BAND XMTR
21. ALQ-137 MID BAND XMTR
22. ALQ-137 OMNI MID BAND XMTR
23. TFR (2)
24. NAV RADAR
25. RADAR ALTIMETER
26. ALQ-137 OMNI LOW AND MID BAND XMTR
27. ALQ-137 HIGH BAND XMTR
28. ALQ-137 HIGH BAND REC AND XMTR

Courtesy of the U.S.A.F.

Captain Jim Miklasevich photographed the details of the EF-111A for Detail & Scale while it was being evaluated at Mountain Home AFB. Most of the photos on the next three pages were taken by Captain Miklasevich. Along with the photos, Jim sent these comments about the "Spark Vark."

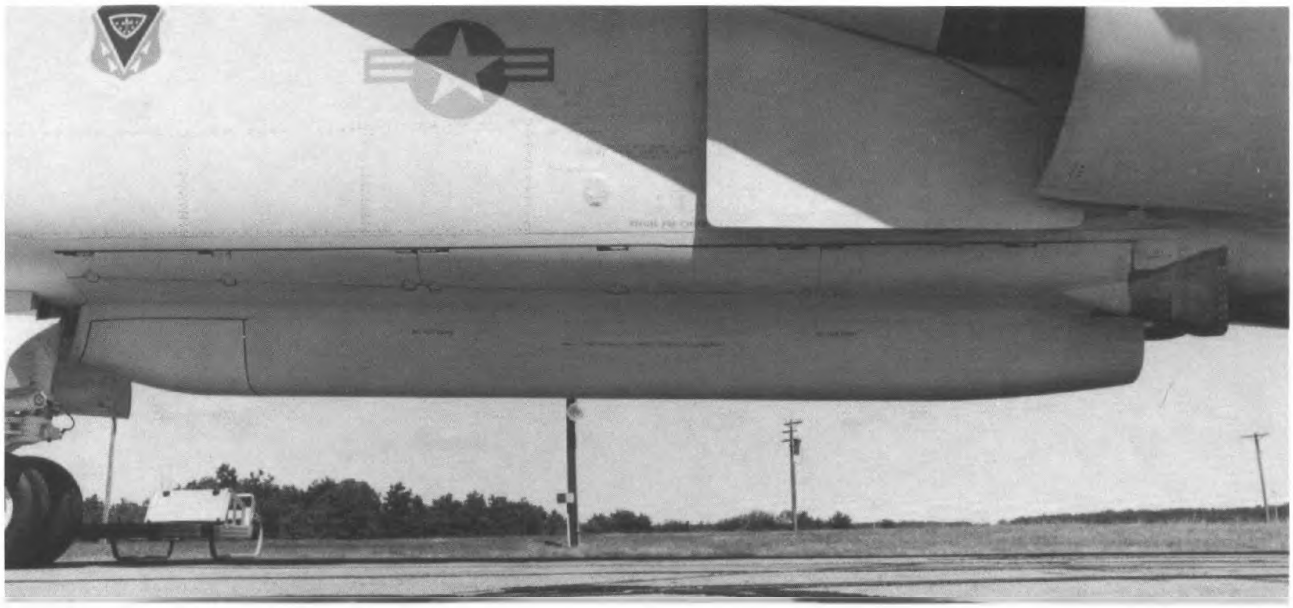
"When the EF-111 first came to Mountain Home for operational testing in 1977, it was decked out in a two-tone compass grey paint scheme similar to that on the F-15. However, over the years the bright Idaho sunlight faded the greys so that it has an overall medium grey finish. I asked the people in the corrosion control unit what FS-595 number they use on the Spark Vark. Well, they really didn't know since the paint came from depot maintenance in Sacramento, and about the best they could come up with would be "an A-10 grey." I've tried to match the EF-111 with my FS-595 and I came up with FS 36463. The official paint colors were recently changed. They are now FS 36320 for the top, FS 36492 for the lower surface and FS 35237 for markings.

All the pictures I managed to take of the EF show it decked out in "brilliant" markings, i.e., stars and bars and squadron emblem. Since then, the EF has come out of the shop with the subdued grey insignia.

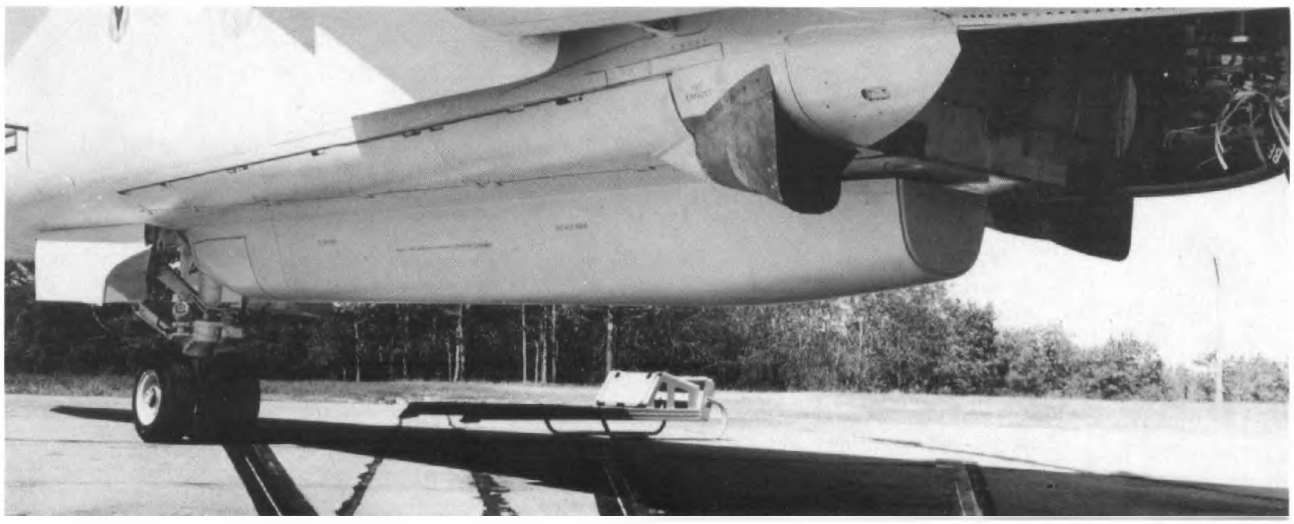
As you can see from some of the photos, the EF has some new additions to the fuselage, the most obvious being all the various bumps and bulges belonging to the advanced jamming gear. The electronics bay has a "canoe" attached to the bottom of the fuselage, there are two new winglets over the main wheels, a few new cooling ducts on the fuselage sides and horizontal tail area, and of course the huge electronics bulge on the tail.

The performance of the EF has not been reduced very drastically by these new additions. The people I've talked to who have flown it say that it's just like flying a regular F-111 but with some Mk-82's on board. Also, the EF can do everything the regular 111's can do except bomb. Apparently the EF-111 will do a super job flying escort with a strike force and be able to provide stand-off jamming and protection into and near the target area. With its new programmable threat computer, the EF can also modify its capabilities as the enemy changes and upgrades his threats. This should insure that the EF-111 will be around for many years to come as the only electronic countermeasures aircraft in the Air Force inventory."

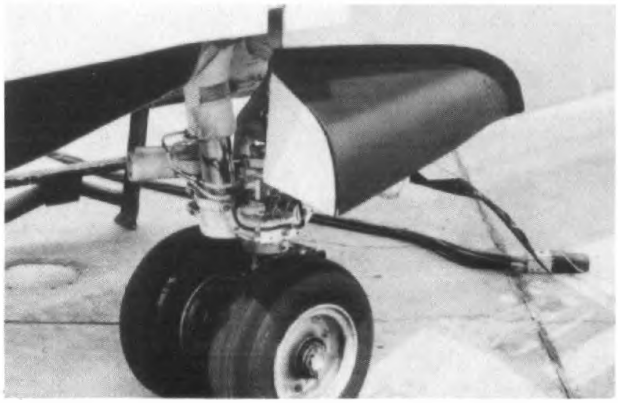
ALQ-99 "CANOE" FAIRING



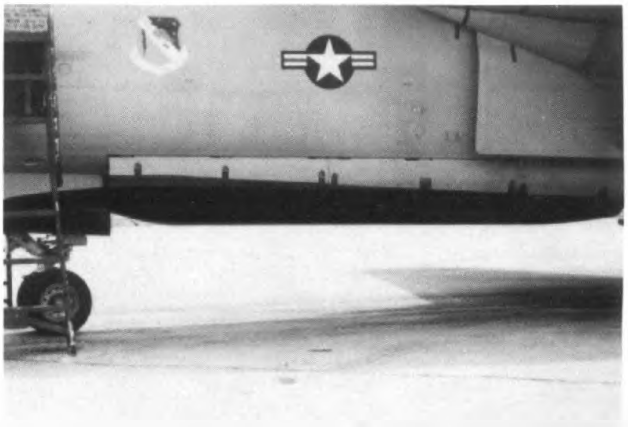
Canoe fairing from left with the door in the closed position. *(Grumman)*



Fairing from the left and behind. *(Grumman)*

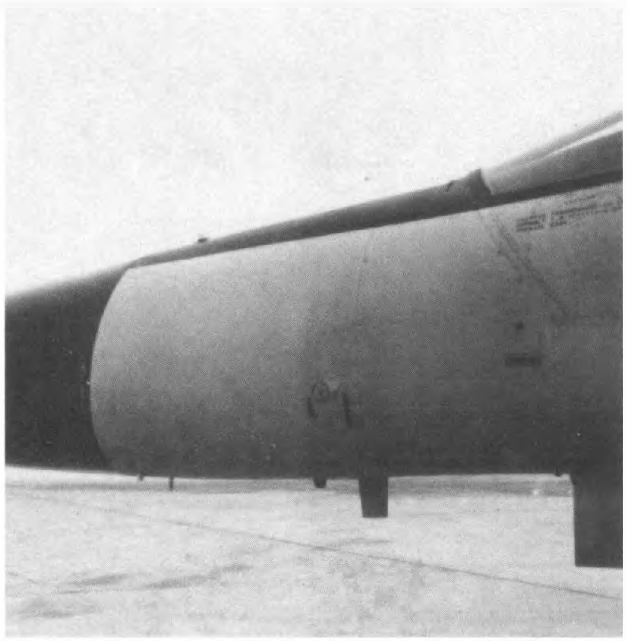


Each nose gear door has a continuation of the fairing attached to the rear to provide for a smooth airflow across the front of the fairing. *(Miklasevich)*

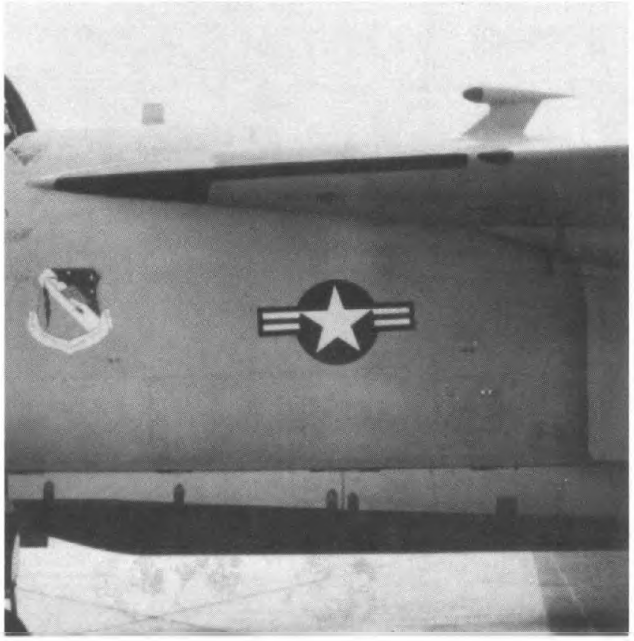


Left side of the fairing with the door in the open position. *(Miklasevich)*

EF-111A WALK-AROUND

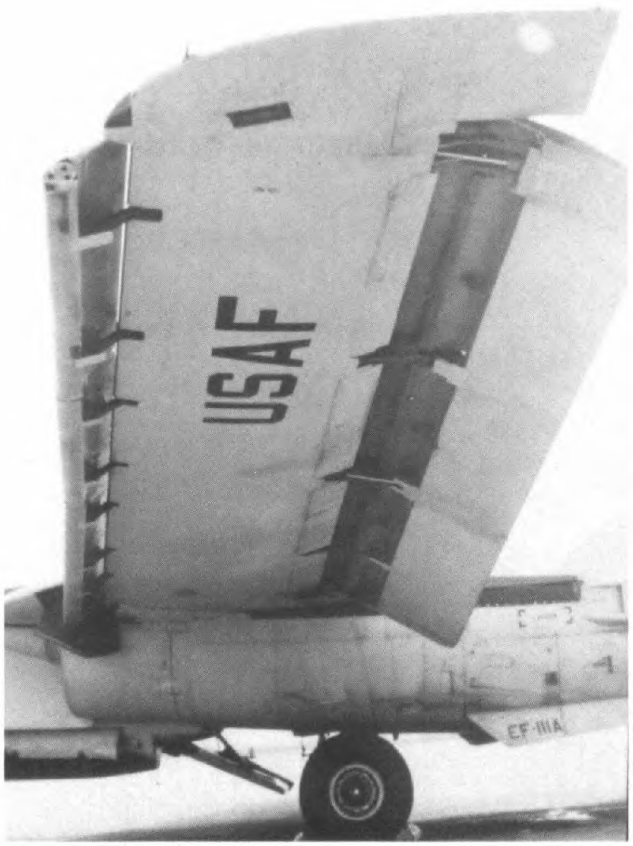


Left side of the nose on an EF-111A. Although not all are visible, nine antennas are located in this area as indicated on page 56.

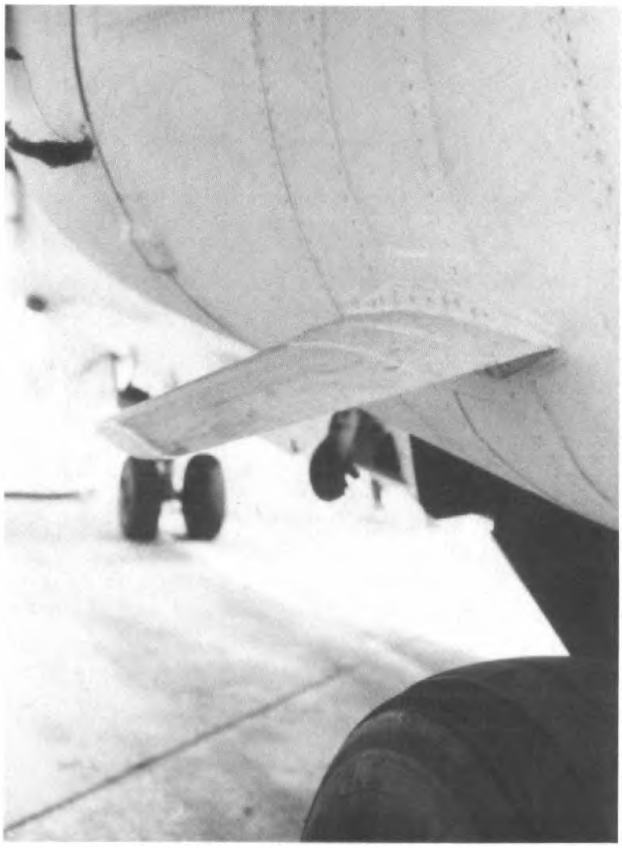


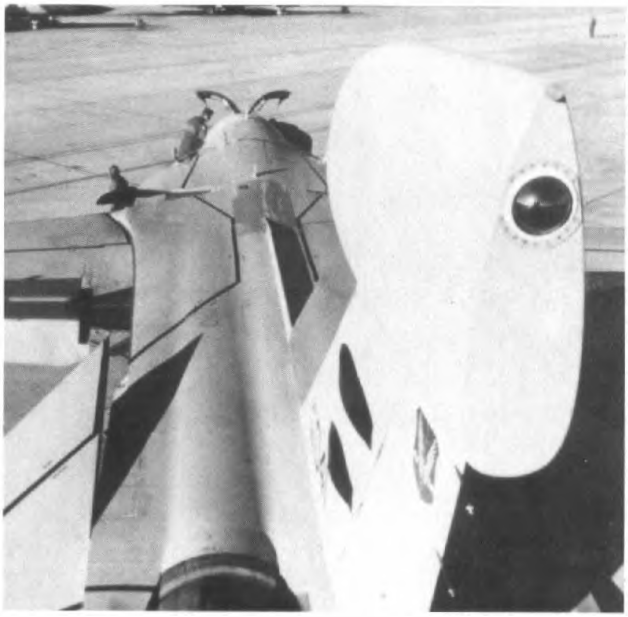
Left side of fuselage just ahead of the air intake. The blade antenna just behind the cockpit is the IFF (upper) and UHF data link antenna. The teardrop shaped antenna is part of the ALQ-137 and ALR-62 systems.

Intake detail on an EF-111A. Note that the intake as used on the standard F-111A is retained.



Slats and flaps in the extended position.





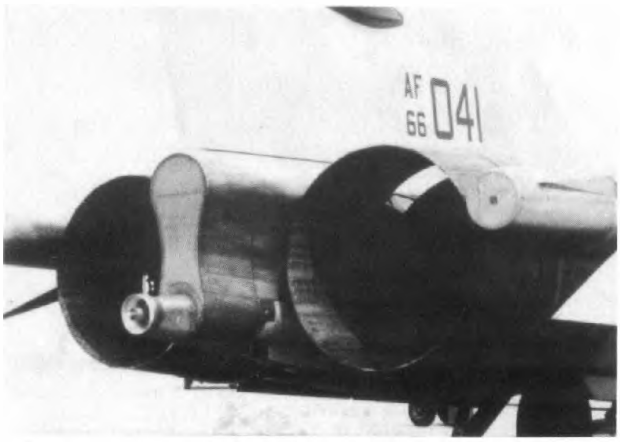
Above: Antenna for ALQ-99 bands 1 and 2.

Above right: The large fairing on top of the tail, which is similar to the one carried on the EA-6 aircraft, contains eighteen different antennas. The two black antennas on the sides of the vertical stabilizer are part of the ALQ-99 system.

Right: Tail fairing from behind.

Below: Engine area. The two fairings on either side of the engines house ALQ-137 antennas.

Below right: Right side of tail area. Note the air intake for the ram air heat exchanger located between the horizontal stabilizer and the fuselage.

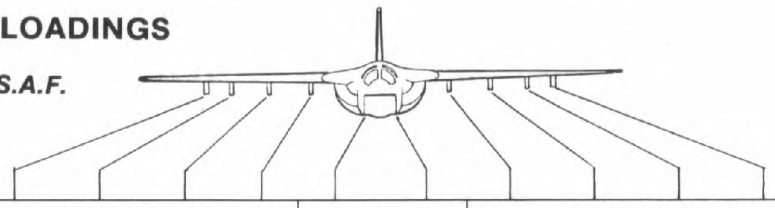


All photos on these two pages are by Captain Jim Miklasevich.

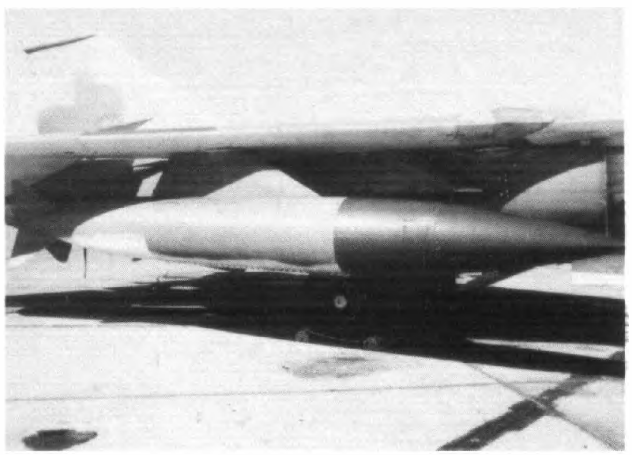
EXTERNAL STORES AND PYLONS

TYPICAL F-111 STORE LOADINGS

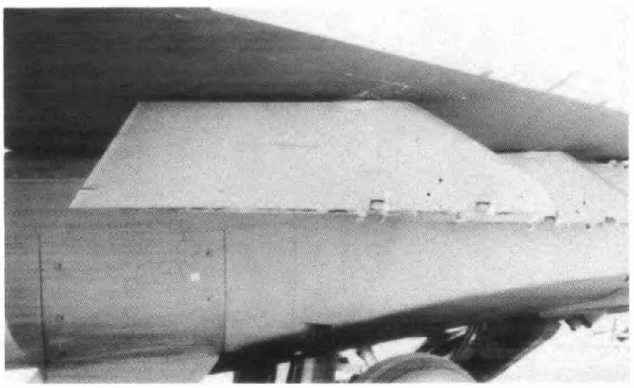
Courtesy of the U.S.A.F.



STORES	PYLON STATIONS				WEAPONS BAY		PYLON STATIONS				TOTAL
	8	7	6	5	RH	LH	4	3	2	1	
BOMBS											
MK-82	-	-	6	6	-	-	6	6	-	-	24
MK-82 Snakeye LD	-	-	6	6	-	-	6	6	-	-	24
MK-82 Snakeye HD	-	-	6	4	-	-	6	4	-	-	20
MK-84	-	-	1	1	-	-	1	1	-	-	4
MK-84 LGB	-	-	1	1	-	-	1	1	-	-	4
MK-36	-	-	6	4	-	-	4	6	-	-	20
M117A1	-	-	6	6	-	-	6	6	-	-	24
M117D	-	-	4	-	-	-	-	4	-	-	8
M117R	-	-	4	-	-	-	-	4	-	-	8
M118	-	-	1	1	-	-	1	1	-	-	4
DISPENSERS & BOMBS											
CBU-24H/B	-	-	6	-	-	-	-	6	-	-	12
CBU-29H/B	-	-	6	-	-	-	-	6	-	-	12
CBU-49H/B	-	-	6	-	-	-	-	6	-	-	12
CBU-52B/B	-	-	6	-	-	-	-	6	-	-	12
CBU-58B/B	-	-	6	-	-	-	-	6	-	-	12
CBU-71/B	-	-	6	-	-	-	-	6	-	-	12
NUCLEAR WEAPONS											
B43	-	-	1	1	1	1	1	1	-	-	6
B57	-	-	1	1	1	1	1	1	-	-	6
B61	-	-	1	1	1	1	1	1	-	-	6
MISSILES											
AIM-9B	-	-	1	1	-	-	1	1	-	-	4
TRAINING											
SUU-20A/A, -20A/M, or -20B/A	-	-	-	1	-	-	1	-	-	-	2
TDU-11/B	-	-	-	1	-	-	1	-	-	-	2
BDU-8/B or -18/B	-	-	1	1	1	1	1	1	-	-	6
BDU-12/B, -19B or -38/B	-	-	1	1	1	1	1	1	-	-	6
EXTERNAL TANKS											
600 gal	-	-	1	1	-	-	1	1	-	-	4
or											
600 gal	-	1	-	-	-	-	-	-	1	-	2
GUN MODULE											
M61A1 Gun	-	-	-	-	1	-	-	-	-	-	1



The FB-111A uses a different swivel pylon than TAC's F-111s. This photo shows the type of pylon used on the FB-111A with an external tank attached.



This is the F-111 type pylon on an F-111F. Compare the shape of this pylon to the FB-111A pylon at left. Particularly note the difference in the leading edge. Also note the swivel point which is the only place the pylon is attached to the wing.

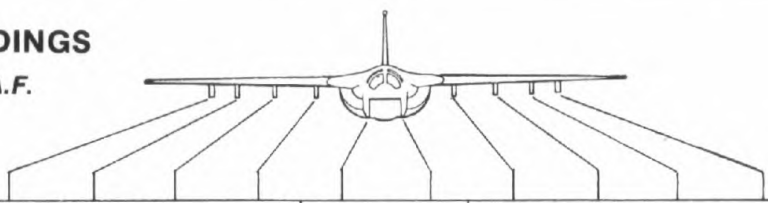
The F-111 uses multiple ejector racks that are different than MERs used on other aircraft. This photo shows the right side of the MER on top, and the left side of the MER on the bottom. (Rotramel)

MERs with bombs attached on an F-111D. (Jackson)

Front view of the MER on top, and rear view of the rack on the bottom. (Rotramel)

FB-111A STORE LOADINGS

Courtesy of the U.S.A.F.



STORES	PYLON STATIONS				WEAPONS BAY		PYLON STATIONS				TOTAL
	8	7	6	5	RH	LH	4	3	2	1	
BOMBS											
M117A1	-	-	6	6	-	-	6	6	-	-	24
DISPENSERS & BOMBS											
CBU-52B/B	-	-	6	6	-	-	6	6	-	-	24
MISSILES											
AGM-69A	-	-	1	1	1	1	1	1	-	-	6
NUCLEAR WEAPONS											
B43	-	-	1	1	1	1	1	1	-	-	6
B-57	-	-	1	1	1	1	1	1	-	-	6
B61	-	-	1	1	1	1	1	1	-	-	6
EXTERNAL TANKS											
600 gal	-	1	1	1	-	-	1	1	1	-	6

PILOT'S REPORT

F-111A, 67-096, from Mountain Home, AFB. Note the Giant Voice insignia on the nose. ***(Leader)***

Captain Jim Miklasevich, an F-111 driver from Mountain Home AFB, Idaho, gives his impression of the aircraft he flies for a living.

"The name is Afrikaans for 'Earth Pig.' The aardvark has powerful limbs and sharp claws, so it can burrow into the earth at high speeds. Little is known of its habits as it is nocturnal and secretive.

If danger is imminent, it runs to its burrow or digs a new one. If cornered it will roll on its back. However, flight and---above all---superb digging ability are the aardvark's first lines of defense.

One of the most remarkable things about the aardvark is the difficulty zoologists have had in finding it a place in the scientific classification of animals. So the aardvark is out on an evolutionary limb, a species all on its own with no close living relatives. Or perhaps we should say rather that it is on an evolutionary dead stump, the last of its line." --- The International Wildlife Encyclopedia.

What kind of pilot would claim to fly an aardvark? There are quite a few, but, like their airplane, not too much is known (or heard) from them. I've been flying the F-111 for about four years now and have served a tour overseas at RAF Upper Heyford before coming to Mountain Home AFB, Idaho. The F-111 has been an extremely interesting airplane to fly, and some of its unique features make for some interesting "war stories." However, this really won't delve very deeply into that particular aspect of the aardvark since I would rather spend this time covering some things about the F-111 that you won't find in most books.

When I first saw a one-eleven I thought it was big and not too colorful, and it really isn't, but the aardvark does have a personality and character all of its own. All 111's are now painted with standard Vietnam-era camouflage. SAC FB's have their own scheme also, but they're very distinctive from TAC 111 s in many ways. The F-111C, D, E, and F have the same style paint scheme, while the A model has a different paint scheme. In keeping with the philosophy of "darker is smarter," the entire 111 fleet is converting to subdued tail codes and insignia. I guess we're trying to make the 111 less noticeable.

Here at Mountain Home AFB we have three F-111A squadrons assigned: the 389th TFTS, 390th TFS and 391st TFS. The only distinctive feature of the aircraft belonging to their respective AMU's (Aircraft Maintenance Unit or maintenance squadron) is a narrow color strip at the top of the vertical stabilizer. Colors are: 389th - bright yellow, 390th - light green, 391st - medium blue. No other squadron insignia is carried, but there are differences in aircraft configuration depending on the squadron. The 390th TFS is the main fighter unit on base, and they carry some specialized ordnance and hardware at times.

On some early versions of the F-111 you could see the RHAW antennas quite clearly. They were the dark fiberglas colored things on either side of the nose. Today these are painted over on every airplane as it comes out of the paint shop, but you do see a dark antenna every now and then. We're also getting strip lighting on our aircraft with one of the latest modifications underway at this time. The strip lighting really takes the work out of flying formation at night, and we're looking forward to the time when all the aircraft are modified. They took the one airplane with strip lighting (67-096) into the paint shop one day and mistook the strip lighting for RHAWs antennas. You guessed it, when it came out of the shop, the strip lighting was painted over -- subdued

strip lighting! Very conscientious paint shop here!

When an aardvark is sitting on the ground there are a few things to note. At Mountain Home we have quite a bit of ramp space and so we taxi and park the airplane with the wings in the fully swept forward position. Overseas in USAFE it was common practice to taxi to and from shelters with the wings at 54° It made maneuvering a bit easier. Naturally, with the wings back the slats and flaps should be up and conversely with the wings forward the slats and flaps are usually down, but this is not always the case. With the wings swept back there is a tendency for the nose strut to extend, especially with light fuel loads. And when the engines are shut down the stabilizers should be trailing edge down (tail droop). If they are not, it indicates a serious malfunction in the flight control system. It is evidenced by the horizontal tail' failing to droop, and in flight would go either full up or full down without any warning to the aircrew members.

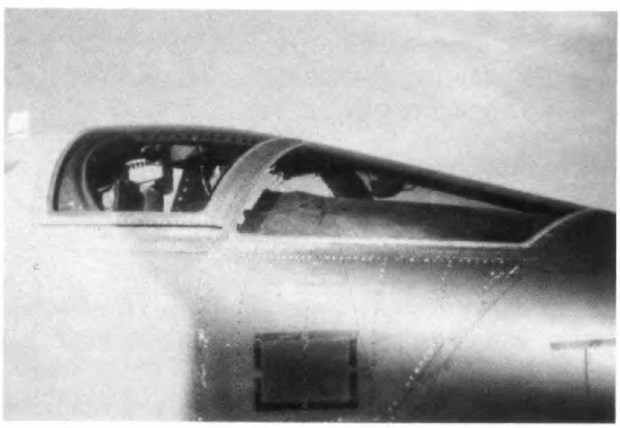
Another thing to note would be the underwing configuration since the F-111 carries no "standard" ordnance load. Most of the A models carry four swivel pylons and one or two SUU-20 s. The airplane can carry fixed pylons on the outermost wing stations (total of eight underwing stations), but I have never seen them carried, and I don't think I ever will. With eight loaded pylons, performance and range drastically decrease, and we'd probably be over our inflight gross weight limitation of 100,000 pounds. The SUU-20 is now being camouflaged (the so-called "Combat SUU"), so you might see white SUU's and green SUU's on the same airplane. We do not carry ECM pods on the A model, but USAFE versions carry the ALQ-119 on a centerline station just aft of the main gear well. Mk-82 500 pound bombs are often carried on the outermost swivel pylons in a slant-four configuration (four bombs on the four outermost stations on the bomb rack). We can carry Mk-84 Laser Guided Bombs (LGB s), and those will also go on the outermost pylons. We also have the capability to carry 650 gallon fuel tanks, but I have only seen those worn by E and F models. Again they go on the outermost stations.

The weapons bay can carry two weapons or one weapon and the M61 gatling gun. The bay is usually open on the ground and, if the gun is carried, the right side of the bay can not be opened. Most of the "green tails" here on base have the gun while the other squadrons usually do not.

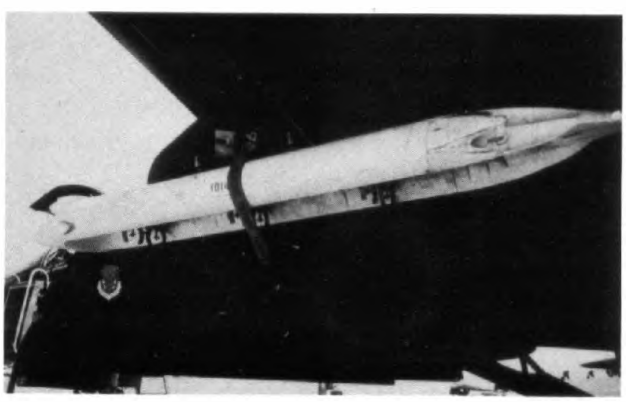
The bird-proof canoy is also interesting. It is acrylic plastic about an inch thick. As a result of the thickness, there is a bit of rippling in some areas, and it has a prismatic effect. You can also see the orange edging to the plastic, and it appears to be an orange strip around the canopy. The canopy also appears to have a dark tint to it. I have seen a film taken during the testing of the bird-proof windscreen, and it seems to work well. The production engineers developed a pneumatic cannon and used store-bought chickens as ammunition against the windshield. It worked!

So you can see that although the F-111 is not as colorful as say the F-4, it is still a most interesting aircraft. I have tried to cover some of the not-so-obvious things that both the enthusiast and the modeler would be interested in. I think the aardvark is different when it gets into the air. Somehow it seems to change its character with configuration and wingsweep. In short, the F-111 has a character all its own. Like the animal for which it is named, it is hard to find a classification for it. It is not really a fighter, not really a bomber. It is a species all on its own with no close relatives. Or is it that dead stump - the last of its line?

Jim Miklasevich
Captain, U.S. Air Force
F-111 Driver

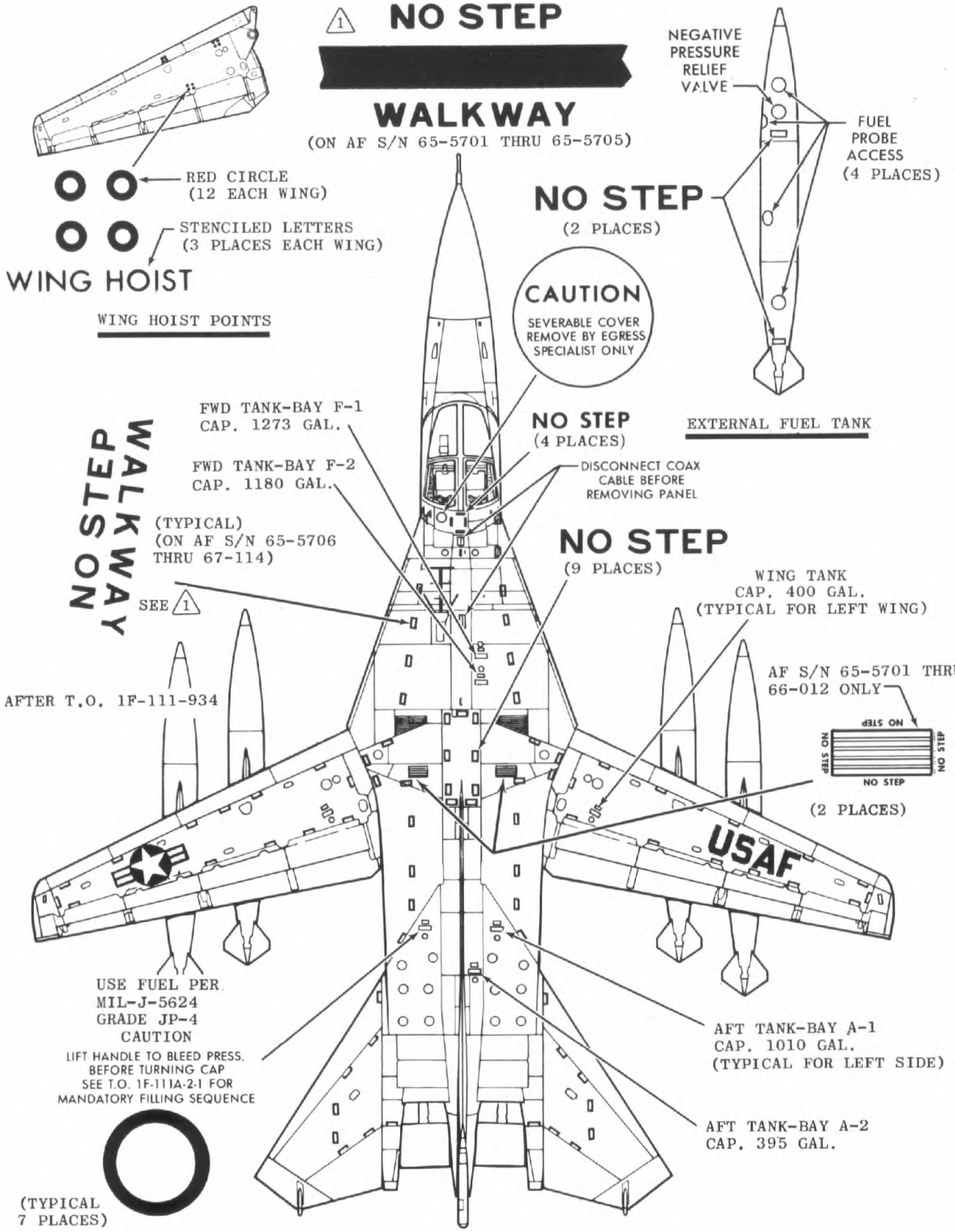


Close-up of the bird-proof canopy. (Miklasevich)

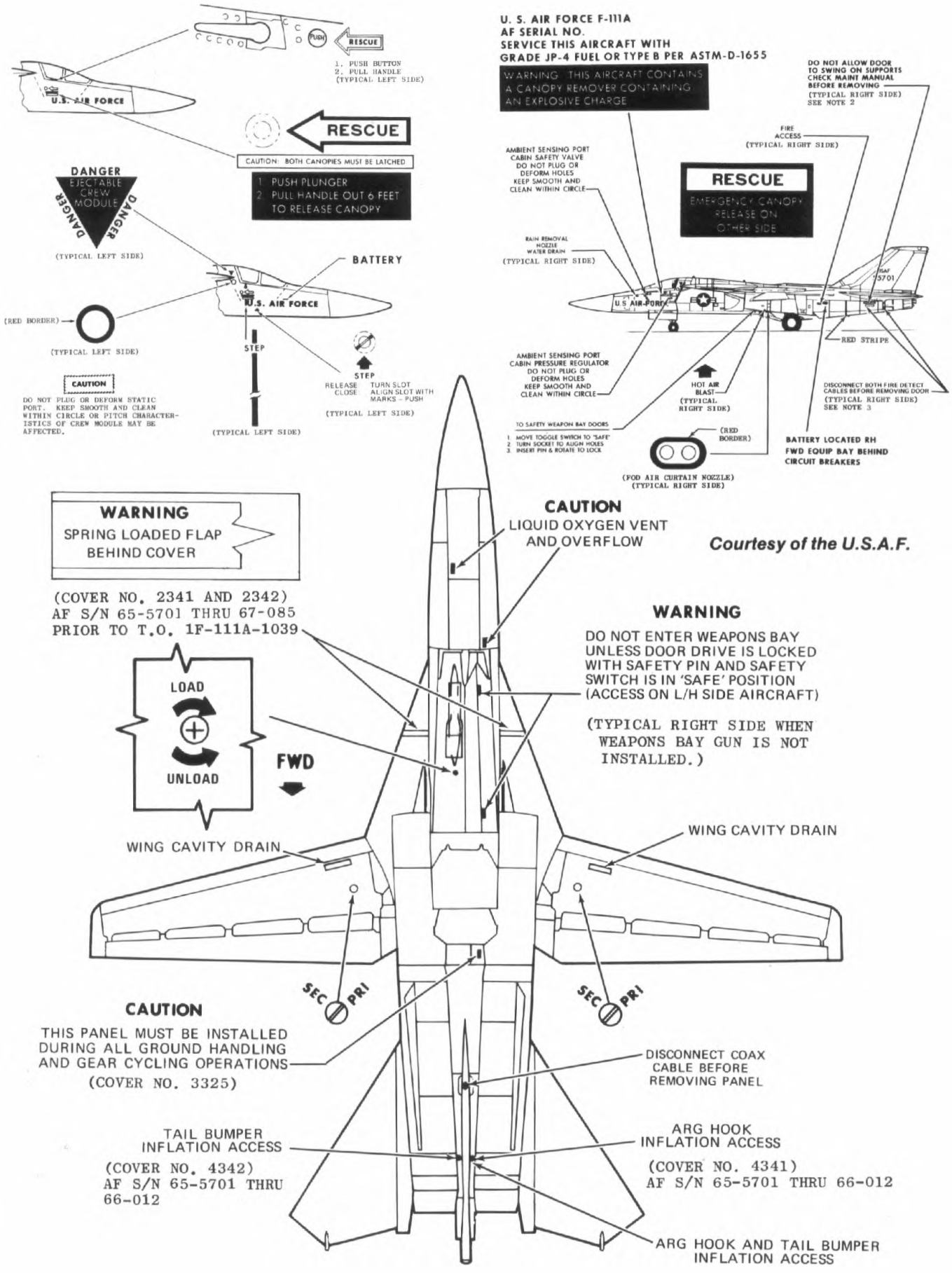


SUU-20 practice dispenser on an F-111A at Mountain Home, AFB. (Miklasevich)

EXTERNAL MARKINGS



Courtesy of the U.S.A.F.


U. S. AIR FORCE F-111A
AF SERIAL NO.
SERVICE THIS AIRCRAFT WITH
GRADE JP-4 FUEL OR TYPE B PER ASTM-D-1655
WARNING THIS AIRCRAFT CONTAINS A CANOPY REMOVER CONTAINING AN EXPLOSIVE CHARGE
DO NOT ALLOW DOOR TO SWING ON SUPPORTS CHECK MAINT MANUAL BEFORE REMOVING
(TYPICAL RIGHT SIDE) SEE NOTE 2
FIRE ACCESS (TYPICAL RIGHT SIDE)
AMBIENT SENSING PORT CABIN SAFETY VALVE DO NOT PLUG OR DEFORM HOLES KEEP SMOOTH AND CLEAN WITHIN CIRCLE
RESCUE
EMERGENCY CANOPY RELEASE ON OTHER SIDE
RAIN REMOVAL NOZZLE WATER DRAIN (TYPICAL RIGHT SIDE)
RED STRIPE
AMBIENT SENSING PORT CABIN PRESSURE REGULATOR DO NOT PLUG OR DEFORM HOLES KEEP SMOOTH AND CLEAN WITHIN CIRCLE
HOT AIR BLAST (TYPICAL RIGHT SIDE)
DISCONNECT BOTH FIRE DETECT CABLES BEFORE REMOVING DOOR (TYPICAL RIGHT SIDES) SEE NOTE 3
TO SAFETY WEAPON BAY DOORS
1. MOVE TOGGLE SWITCH TO 'SAFE'
2. TURN SOCKET TO ALIGN HOLES
3. INSERT PIN & ROTATE TO LOCK
(RED BORDER)
(FOD AIR CURTAIN NOZZLE) (TYPICAL RIGHT SIDE)
BATTERY LOCATED RH FWD EQUIP BAY BEHIND CIRCUIT BREAKERS
1. PUSH BUTTON
2. PULL HANDLE
(TYPICAL LEFT SIDE)
U.S. AIR FORCE
RESCUE
CAUTION: BOTH CANOPIES MUST BE LATCHED
1 PUSH PLUNGER
2 PULL HANDLE OUT 6 FEET TO RELEASE CANOPY
DANGER
EJECTABLE CREW MODULE
(TYPICAL LEFT SIDE)
BATTERY
(RED BORDER)
(TYPICAL LEFT SIDE)
STEP
RELEASE CLOSE
TURN SLOT ALIGN SLOT WITH MARKS – PUSH
(TYPICAL LEFT SIDE)
CAUTION
DO NOT PLUG OR DEFORM STATIC PORT. KEEP SMOOTH AND CLEAN WITHIN CIRCLE OR PITCH CHARACTERISTICS OF CREW MODULE MAY BE AFFECTED.
(TYPICAL LEFT SIDE)
WARNING
SPRING LOADED FLAP BEHIND COVER
(COVER NO. 2341 AND 2342)
AF S/N 65-5701 THRU 67-085
PRIOR TO T.O. 1F-111A-1039
LOAD
UNLOAD
FWD
CAUTION
LIQUID OXYGEN VENT AND OVERFLOW
Courtesy of the U.S.A.F.
WARNING
DO NOT ENTER WEAPONS BAY UNLESS DOOR DRIVE IS LOCKED WITH SAFETY PIN AND SAFETY SWITCH IS IN 'SAFE' POSITION (ACCESS ON L/H SIDE AIRCRAFT)
(TYPICAL RIGHT SIDE WHEN WEAPONS BAY GUN IS NOT INSTALLED.)
WING CAVITY DRAIN
WING CAVITY DRAIN
SEC PRI
SEC PRI
CAUTION
THIS PANEL MUST BE INSTALLED DURING ALL GROUND HANDLING AND GEAR CYCLING OPERATIONS
(COVER NO. 3325)
DISCONNECT COAX CABLE BEFORE REMOVING PANEL
TAIL BUMPER INFLATION ACCESS
(COVER NO. 4342)
AF S/N 65-5701 THRU 66-012
ARG HOOK INFLATION ACCESS
(COVER NO. 4341)
AF S/N 65-5701 THRU 66-012
ARG HOOK AND TAIL BUMPER INFLATION ACCESS

MODELER'S SECTION

KIT REVIEWS

PRODUCT REVIEW POLICY. In each of our publications we will try to review kits and decals that are available to the scale modeler. We hope to be able to review every currently available kit that is useable by the scale modeler. Kits produced in the past that are no longer generally available, and those more intended to be toys than accurate scale models will not usually be covered. Additionally, we do not intend to give a complete step-by-step, correction-by-correction account of how to build each kit. Instead we intend to give a brief description of what is available to the modeler, and point out some of the good and not-so-good points of each kit or product. In this way we hope to give an overall picture of what the modeler has readily available for his use in building the particular aircraft involved.

1/144th SCALE KITS

Crown Kit No. 4:

This small kit has been boxed as a USAF F-111A and an Australian F-111C. It is neither. The intakes are not those used on the F-111A, and the wings are not those used on an F-111C. Although the outside of the box from our review sample was marked as a General Dynamics F-111C, the instructions indicated a McDonnell Douglas F-111! Maybe Crown knows something we don't.

The proportions of the kit are off, most noticeably under the nose which is too fat. The top of the fuselage is too rounded, detail is lacking, and the smaller parts are too thick even considering that this is a 1/144th scale kit. Two external fuel tanks are provided for the wing pylons.

Under the model, the speed brake/forward main landing gear door it too flat. The cockpit is represented by an open hole which is covered by a very thick and misshapen canopy.

Surface scribing is of the recessed type, and is very fine even if it is not altogether accurate. In short, this kit just does not build up into an accurate or representable F-111.

Box art for the Crown 1/144th scale kit.

Otaki Kit No. OT2-21:

For our money this is the better of the two F-111 kits in 1/144th scale. It represents an F-111E, and is generally accurate in shape proportions and dimensions.

Surface scribing is recessed, and although not as fine as that on the Crown kit, it is more accurate. The landing gear is more delicately molded than that on the Crown kit, and looks a lot more like the real thing.

The cockpit is plugged without any detail, and even in this scale you would think that you would at least get some seats.

With a little detailing, particularily in the cockpit area, this kit can be made into a nice looking model. By changing the intakes with the use of some thin plastic card, the model can be made into an F-111A, and a real die-hard could even convert it to an F-111B. If you are really a masochist, many hours can be spent making this kit into an FB-111A or an F-111C. We recommend this kit.

Otaki 1/144th scale F-111E.

1/135th SCALE KIT

Lindberg Kit No. 595:

The box claims this is an F-111A, while the box art depicts a short nose (Navy) F-111B in Air Force camouflage! Unfortunately, the kit inside doesn't come off any better than the box. For example, the nose landing gear strut is at the forward end of the well instead of the rear, and the brace runs to the back instead of the front. The canopy has no frame, and is completely the wrong shape. The wheels - well they are round! We could go on, but suffice it to say that no part of this model accurately represents the real thing. Enough said!

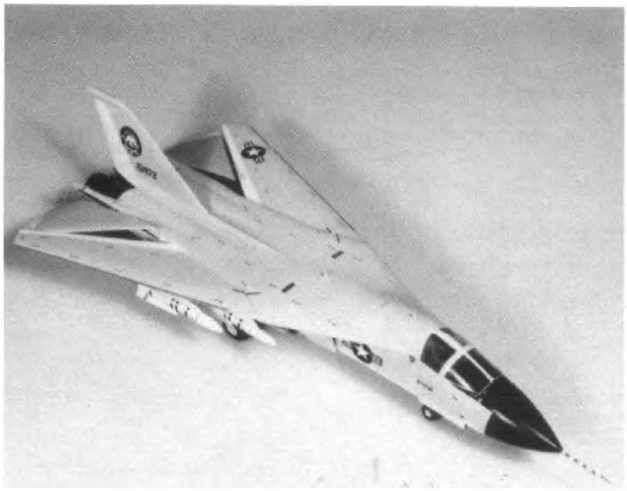
Lindberg box art for their F-111A kit.

1/72nd SCALE KITS

Revell Kits Nos. H-208 and 5804:

When originally issued (kit number H-208 in 1969), this kit contained optional parts for both a prototype F-111A and a Navy F-111B. These parts included the Navy's shorter nose, longer wings, and minor differences in the horizontal and vertical tails. Actually these last two options vary from aircraft to aircraft among F-111Bs. But the important options were the short nose and longer wings. These not only gave the option of building the F-111B, but also possible were the FB-111A and F-111C which have the longer wings. As reissued, the kit no longer has the optional parts, and this is very unfortunate. It has markings for a production F-111A, but this kit still has the older RDT&E (prototype) configuration which includes the area between the engines that was tapered to a sharp edge, and in line with the trailing edge of the vertical tail and rudder.

Several working features were designed into the Revell kit. As with other F-111 kits, the wings can be made to move. But beyond that, the horizontal tails are movable, and the landing gear is retractable. The latter feature is at the expense of some detailing on the landing gear struts and doors. There is no interior to the wheel wells, and most modelers will want to add this from plastic card to prevent the



Revell 1/72nd scale F-111B with Phoenix missiles added from an F-14 kit.

model from looking more like a toy.

The kit fits together well except for the area around the crew module. Here you will need to do a lot of filling and sanding. The cockpit area is rather sparse, and most modelers will want to add at least the control columns and probably the throttles. The spacious side-by-side seating arrangement allows for a lot of detailing in the cockpit with little effort.

The Revell kit has the shape and proportions down better than the Airfix kit in most areas. However some updating will be necessary unless an early RDT&E F-111A or an F-111B is being built. If a later model is being built we suggest "bashing" the Revell and Airfix kits together as explained later in, "Building the 'Best Possible' 1/72nd scale F-111."

Airfix & MPC F-111 Kits (Various Numbers):

As originally issued, this kit represented an early F-111A with the earlier tail configuration. As such the kit was turned over to MPC in the United States, and Airfix reworked the kit into an F-111E. Changes included the tail area and the intakes. Two pylons were added, and representations of SUU-20 pods were included to go on the pylons. These pods are lacking in the open area underneath where the small bombs go.

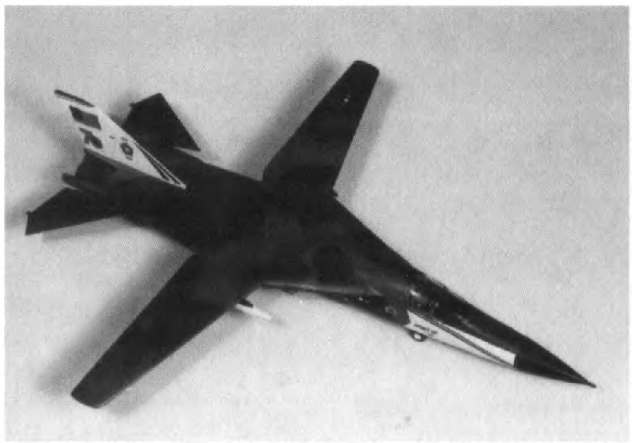
The bottom of the wings have the tops of the flaps molded on to them. This makes for a gap on the top of the wing that is difficult to fill and sand. The crew module area is too narrow, and this is most noticeable when you look at the canopy.

The wheel wells are plugged solid, and this really

looks phoney if you turn the model over and look at its underside. However, the landing gear looks more accurate than that on the Revell kit simply because it is not designed to operate, and therefore does not require the pins, holes, and durability of the Revell gear.

The intakes are closed in at the rear with pieces representing the engine turbines that are to be located at the closed end. In reality the engines are located much further aft than where Airfix has them.

Overall the Airfix kit is not as accurate in shape as the Revell, but it is more up-to-date. Perhaps another company will someday put out a kit that is both accurate and up-to-date, but until then we suggest combining the two existing kits as explained later.



Airfix F-111E in 1/72nd scale with the colorful bicentennial markings from Modeldecal.

1/48th SCALE KITS

Aurora F-111A, Kit No. 368 & F-111B, Kit No. 369

These two kits are almost impossible to find anymore, and are more toys than models. The inclusion of them here is purely academic since Monogram reworked the Aurora molds to develop their kit which is covered next. Our advice is not to build either Aurora kit since you will have to make all the corrections that Monogram has already made, plus do all of the work necessary to make the Monogram kit look right.

Since Aurora is not in the plastic kit business any more, and since Monogram has reworked the molds, these kits are now worth more unbuilt as collector's items.

Monogram F-111A Kit No. 5804:

As explained above, this kit is not really a true Monogram kit. That is to say, it is not a kit that Monogram researched, designed, and molded in its entirety. It is a rework of the old Aurora molds, and as such it would not be completely fair to judge this kit against a pure Monogram kit.

But Monogram was unable to correct all of the deficiencies in the Aurora kit, and added one error of their own, and they are quite difficult to correct by the modeler in most cases. Detail & Scale asked Captain Jim Rotramel, F-111 pilot and IPMS modeler, to cover the problems that exist with this kit. Here are his comments.

"To start off with, the main problem with this kit is that the fuselage is a mass of mistakes. Monogram worked on some of the detail problems including the landing gear, cockpit, and pylons, but skated by the fuselage issue by scribing on some surface detailing. The effect is not unlike putting mag wheels and ganster whitewalls on a rusted out 1962 Falcon station wagon. It's still not right - just strange."

Starting from the front and working back here is what happens. Monogram made a new nose, which is nice, but get out the putty and sandpaper when trying to mate it to the old fuselage. The end result has some rather odd contours. The cockpit glare shield has some concave contours while the real thing is flat. The instrument panel does not bear even a passing resemblance to the real thing. The canopy is the wrong shape, but that is so it will fit the fuselage, which is also the wrong shape.

The intakes are terminal. Their lips are too curved, and there is no interior detail whatsoever (even 1/72nd scale kits have that). This really stands out since the interior of the intake is painted gloss white making this area very noticeable.

The landing gear is pretty nice, but the speed brake/main gear door is too narrow. The problem is that the real speed brake curves as it extends up the sides of the fuselage, and the kit speed brake is flat. For the serious modeler the choice now becomes

Box art for the Monogram 1/48th F-111A.

major surgery on the wheel well or a gear-up model.

The wings are better. The scribing is not correct for the flaps/slats, and there are some minor contour problems on the trailing edge. But compared to the rest of the kit, the wings are a dream.

The pylons aren't bad either. They don't pivot, but they can be modified to do so rather easily. However you can forget the triple ejector racks and bombs. Until now, all the errors mentioned were either directly or indirectly caused by the use of the Aurora molds, but Monogram has to take this mistake in total. No version of the F-111 has ever carried TERs So remove these, and save them for an F-4 kit where they are correct.

The ventral strakes are the wrong shape, and should be replaced by ones made from sheet plastic. (See the drawings in this book.) The bullet fairings that the stabilizers are attached to are too long, the exhaust nozzles are much too long, and the center fairing a little too short. The contours on top of the fuselage above the engines are too pronounced. The best guide for recontouring the fuselage is the Revell kit.

In summary, while an average Monogram kit can be made into an excellent model with a minimum of effort, this is not an average Monogram kit. The serious modeler faces a massive challenge to turn this kit into an acceptable model."

From Captain Rotramel's review, it is evident that this kit is not what could be called an excellent kit. To top it off, Monogram got the crew names backward! But, if you insist on building in 1/48th scale, for now this is the only kit available.

BUILDING THE "BEST POSSIBLE" 1/72nd SCALE F-111 (or Bashing the Revell and Airfix Aardvarks)

A more accurate F-111A can be built by combining the Airfix and Revell kits. Captain Jim Rotramel, an F-111 pilot and scale modeler tells how it is done.

Based on the reviews of these two kits, it is evident that neither alone can be built to adequately represent a production F-111. To make a good production F-111 requires both the Revell kit and the Airfix F-111E kit. The recommended combination of parts is as follows:

- Lower fuselage, inlets, landing gear; this selection depends on the version to be built. For the F-111A, F-111C, and EF-111A, the Revell kit should be used. For the FB-111A, F-111D, E, or F, the Airfix kit should be used. The important difference here is the intake design required. The larger diameter tires from the Airfix kit should be used for all versions. The actual main landing gear structure is almost invisible when the model is finished, so either is acceptable, but the Airfix version probably looks better.
- Wings; The thinner Revell wings are better, but use the weapons pylons from the Airfix kit. (Except for the EF-111A, the F-111 is seldom flown without pylons.) Building an F-111 with the flaps and slats down is recommended for only the most dedicated masochist.
- Upper fuselage, vertical tail; Use the Revell kit, because it has the "humps" over the wing pivot points.
- Ventral fins; Revell's are closest.
- Horizontal Tail; Airfix, simply because they are in one piece.
- Exhaust nozzles; Use Revell's and modify them by cutting 1/10th of an inch (6 scale inches) off of the front of the two parts numbered 50 which are the aft portion of the nozzles.
- Tail fairing (center) and tail cones (outboard); Use the Airfix. Due to a design difference between the two kits, it will be necessary to cut off the tail fairings molded into the top fuselage halves of both kits and glue the Airfix fairings and cones to the bottom half of the fuselage.
- Crew module and nose; Use the Revell kit. The truth lies between the two. However the Revell kit looks closer, and the Airfix canopy is just too narrow. Mounting the Revell module and nose to the Airfix fuselage will provide hours of modeling pleasure!

Following the above procedure will provide the best possible 1/72nd scale F-111 model. Once this much has been accomplished, other things like ECM pods, a gun blister, Pave Tack pod (F-111F only), vents, camera windows, weapons bay, and other details can be added. But the basis now exist to make an attractive and accurate model.

F-111 "NORMAL" CONFIGURATIONS

Captain Jim Rotramel has provided this chart that shows the configuration of the F-111 under different conditions. This chart is included to assist modelers in making their models as accurate as possible.

Prior to Engine Start
Blow-in doors/movable cowl - closed
Stabilizers - drooped
Wing sweep - 16 degrees
Flaps - 35 degrees
Slats - down
Weapons bay - open

After Engine Start
Blow-in doors/movable cowl - open
Stabilizers - streamline
Weapons bay - closed
Note: After flight control checks the flaps and slats are retracted and the wings swept 54 degrees for taxi.

Prior to Takeoff
Blow-in doors/movable cowl - open
Stabilizers - streamline
Wing sweep - 16 degrees
Flaps - 25 degrees
Slats - down
Spoilers - up with throttles in idle

During Flight
Blow-in doors/movable cowl - closed
All other devices - as required. (Most common wing settings are 26, 54, and 72.5 degrees)

Prior to Landing
Blow-in doors/movable cowl - closed
Wing sweep - 16 degrees
Landing gear - down
Slats - down
Flaps - down (35 degrees except for single engine, then 25 degrees)

Landing (Touchdown)
Same as "Prior to Landing" except spoilers-up.

After Landing (Taxi)
Blow-in doors/movable cowl - open
Wing sweep - 54 degrees
Flaps - retracted
Slats - retracted

Prior to Shutdown
Blow-in doors/movable cowl - open
Stabilizers - streamlined
Wing sweep - 16 degrees
Flaps - 35 degrees
Slats - down
Weapons bay - open

Shutdown
Stabilizers - Slowly droop

DECAL SUMMARY

Note: It is impossible to completely review decals unless the reviewer has actually used the decals on a model to see how they fit. Additionally, markings on a given aircraft can be changed from time to time, so it is possible that the decals may be accurate for one point in time and not another. Therefore, this section is more of a listing of decals available than a review. Review comments are made only in regard to fit when we have actually used the decals or as to accuracy when the evidence clearly indicated an error.

1/144th SCALE KITS

Crown Kit No. 4: F-111A, 65-5708. The decal sheet contains minimal markings including national insignia, ejection triangles, a red rescue arrow, and the serial number with USAF above.

Otaki Kit No. OT2-21: F-111E, 68-006. The sheet includes a 20th TFW shield and UH tail code.

1/135th SCALE KIT

Lindberg Kit No. 595: The decals in this kit do not represent the specific markings ever used on an F-111.

1/72nd SCALE KITS

Airfix Kit No. 04008-6: F-111E of the 20th TFW. Markings are supplied for 68-027, 68-054, 68-055, and 68-069; for the 79th TFS, 78th TFS, 77th TFS, and 55th TFS; with tail codes UH, JR, JT, and JS; respectively. Basic air-

craft stenciling is provided.

USAirfix Kit No. 40030: F-111F, 71-883, of the 366th TFW, with "Spirit of Mountain Home" marking carried in SAC's Giant Voice '74. Basic stenciling is provided on this Scalemaster sheet.

MPC Kit 2-1510-150: Three sets of decals are provided in this kit.

1. The first RDT&E YF-111A, 639766, in the gray over white scheme.
2. The first Navy YF-111B, 151970. However parts for an F-111B are not provided.
3. An FB-111A, 68-0279, from the 380th Bomb Wing. However the parts for the FB-111A (longer wings and fuselage) are not provided.

Revell Kit No. H208-200: Three sets of aircraft markings are provided in this kit.

1. USAF F-111A, 65-5708, in camouflage with minimal markings.
2. USN F-111B, BUNO 152714, with codes for Atlantic Fleet's VF-101 (tail code AD)
3. Pacific Fleet's VF-121 (tail code NJ), with airplane numbers 124 and 105 respectively. (Both sets of Navy markings are fictious.)

Revell Kit No. H-4303: F-111A, 65-5708, camouflaged with minimal markings.

1/48th SCALE KIT

Monogram Kit No. 5804: F-111A, 67-054, from the 474th TFW, 422nd TFS. One of Monogram's better decal sheets, it contains TAC and 474th TFW badges, crew names, nose gear door markings, crew ejection module warnings, and the in-flight refueling receptacle markings. However the crew names are reversed.

1/72nd SCALE SHEETS

ECSI Sheet No. 88: Comes with markings for two aircraft.

1. FB-111A, 68-245, of the 509th BW with a flying "2" on the vertical fin.
2. F-111A, 67-085, from the 474th TFW, 428th TFS. The tail markings consist of the code NA and a black bordered white stripe with blue chevrons.

Microscale Sheet No. 72-132: Contains markings for seven aircraft.

1. USAF F-111E, 68-045, of the 20th TFW, 77th TFS, in camouflage.
2. USAF F-111A, 68-025, of the 474th TFW, 428th TFS, Det. 1 F-111A Test Force. This camouflaged aircraft carried a black and yellow dart on the rudder.
3. USAF F-111A, 67-064, of the 474th TFW, 429th TFS. This aircraft has an NA tail code, yellow fin stripe, TAC badges on the fin, and the 474th TFW badge on the fuselage.
4. USAF FB-111A, 69-6508, of the 2nd AF. This aircraft has a flying duce on the vertical fin.
5. USAF FB-111A, 63-9783. This aircraft has a Navy style gull gray and white paint scheme with the SAC band on the nose.
6. USN F-111B, BUNO 151972. This black-nosed, gray and white aircraft was used to test the Phoenix missile system and as such carries the test program insignia on the vertical fin. However many markings are missing.
7. RAAF F-111C, 67-125. This camouflaged aircraft has the RAAF roundels on the fuselage, red, white, and blue fin flashes, and tail codes A8-125.

Microscale Sheet No. 72-285: F-111F, 67-096, of the 366th TFW. In addition to the MO tail codes and the TAC badges, this aircraft has the 366th TFW badges and Giant Voice insignia. This aircraft is painted in a wrap-around camouflage scheme.

Modeldecal Sheet No. 37: F-111E, 68-028, of the 20th TFW, 77th TFS. This aircraft carried one of the most elaborate bi-centennial schemes for an aircraft of this type. The entire vertical fin and fuselage between the black radome and the aft edge of the nose gear wheel well was white. A diagonal red, white, and blue stripe with the words "Spirit of '76" adorned the nose. A red, white, and blue wedge, bi-centennial "pretzel", large red, white, and blue 76, and 1776 flag were applied to the vertical fin. The fin cap was red, white, and blue.

1/144th SCALE SHEET

Microscale Sheet No. 14-132: This sheet provides markings for the same seven aircraft as Microscale sheet 72-132.

REFERENCE LISTING

Note: Listed here are references on the F-111 that should prove helpful in providing information and photographs of a different nature and format than what is presented in this publication. With each listing is a brief description of what that reference covers. There are many fine references on the F-111, and they cannot all be listed here. The fact that a given reference is not listed is not intended to reflect unfavorably on that reference.

1. Gunston, Bill, F-111, Charles Scribner's Sons, New York, 1978.

In our estimation, this is the best, most complete, and most accurate book on the development, history, and combat use of the F-111.

2. Drendel, Lou, F-111 in Action, Squadron/Signal Publications, Carrollton, Texas, 1978.

An excellent book on the F-111 with extensive photographic coverage and an account of a flight in the F-111 by the author.

3. Miska, Kurt, General Dynamics F-111A to F & FB-111A, Profile Publications Limited, Windsor, Berkshire, England, 1973.

A rather small (24 page) booklet covering the development and technical data of the F-111 series of aircraft.

4. Miller, Jay, General Dynamics F-111, Aero Publishers, Fallbrook, California, 1981.

Covers the development, history, combat use, and technical data of the F-111. Includes information on the FB-111H program.

5. GD, F-111/FB-111, Koku Fan Special No. 85, Bunrin-Do, Japan, 1977.

Provides extensive pictorial coverage of a general nature of the F-111A, B, C, D, E, F, and FB-111A aircraft, Japanese text.

6. Ulsamer, Edgar, "EF-111A, USAF's Supersonic Electronic Shield," Air Force Magazine, August, 1977, Page 54.

Excellent article on the introduction of the EF-111A into the Air Force inventory. The best article published on the EF-111A to date.

7. Ulsamer, Edgar, "New Era in Electronic Warfare," Air Force Magazine, September, 1981, Page 116.

A follow-on article to number 6 above, providing the latest information on the EF-111A tactical jamming system.

8. "FB-111A Mission Profile," Air Force Magazine, April, 1981, Page 64.

A good article that tells in story and photos what it is like to fly on an FB-111A mission.

9. Braybrook, Roy M., "Variable Geometry Today,", Air International, Volume 8, Number 3, March 1975, Page 111.

An excellent article which covers more than just the F-111. It compares and discusses the operational variable geometry wing aircraft, and thus provides a look at the F-111 along side of its contemporaries.

10. "The Annals of the Polymorph," Air International, Volume 8, Numbers 3, 4, & 5, March, April, May 1975, Pages 134, 185, & 249 respectively.

Another article that does not only cover the F-111, but presents the history of variable-sweep wings in aviation. This gives an outstanding background to what came before the F-111 and thus provides a better understanding of variable geometry and the F-111 program.

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